WADE-8020

User's Manual

Version 1.4

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How to Use This Manual

The manual describes how to configure your WADE-8020 system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1: System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2: Hardware Configuration. Show the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3: System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4: BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5: Troubleshooting. Provide various of useful tips to quickly get WADE-8020 running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Chapter 1
System Overview

1.1 Introduction

Powell Inc., a world-leading innovator in the Industrial PC (IPC) market and a member of the Intel® Communications Alliance, has launched its new WADE-8020 in response to market demand for a simplified embedded system board (ESB) that combines a smaller footprint, lower power consumption, robust computing power and with longevity support.

Based on latest mobile Intel® QM57 Express chipset, WADE-8020 takes advantage of Intel® Core™ i5 / i7 processor which has high performance and excellent power management features. WADE-8020 not only supports dual display by VGA / DVI / HDMI / LVDS and the third display via PIC-Express expansion slot. In addition, with its display-enriched interface, WADE-8020 can support various multimedia devices.

Built with 32nm Intel® Core™ i5 / i7 processor and Mobile Intel® QM57 Express chipset, WADE-8020 can provide the best solution for multiple applications such as POS, DVR, Mobile Kiosk, Lottery, Gaming and Digital Signage.

1.2 Check List

The WADE-8020 package should cover the following basic items

One WADE-8020 Mini-ITX Main Board
One SATA Cable
One I/O Shield bracket
One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main Processor**
  - Intel®Core™ i5 / i7 processor
  - CPU clock bus: 1333/1066/800 MHz
- **Chipset**
  Intel® QM57 Express chipset
- **System BIOS**
  AMI BIOS
- **Main Memory**
  Two 204-pin DDR3 SODIMM socket support up to 8GB dual channel 800/1066 MHz memory
- **Expansion Interface**
  - One PCI slot and One PCI-E x1 slot
  - One Mini PCI-E slot
- **SATA Interface**
  Six SATA ports
- **Serial Port**
  Support three RS232 ports and one RS232/422/485 port
- **USB Interface**
  Support eight USB (Universal Serial Bus) ports, four on rear I/O and four on board header for internal devices
- **Audio Interface**
  Connector for Mic-In, Line-In and Line-Out
- **Watch Dog Timer**
  - Support WDT function through software programming for enable/disable and interval setting
  - General system reset
- **On board VGA**
  Intel® Gen 6.0 integrated graphic engine
- **On-board Ethernet LAN**
  Two Gigabit Ethernet (10/100/1000 Mbits/sec) LAN ports using Intel 82574L and 82577LM GbE Ethernet Controller
- **High Drive GPIO**
  Onboard programmable 16-bit Digital I/Os (8x In/Out)

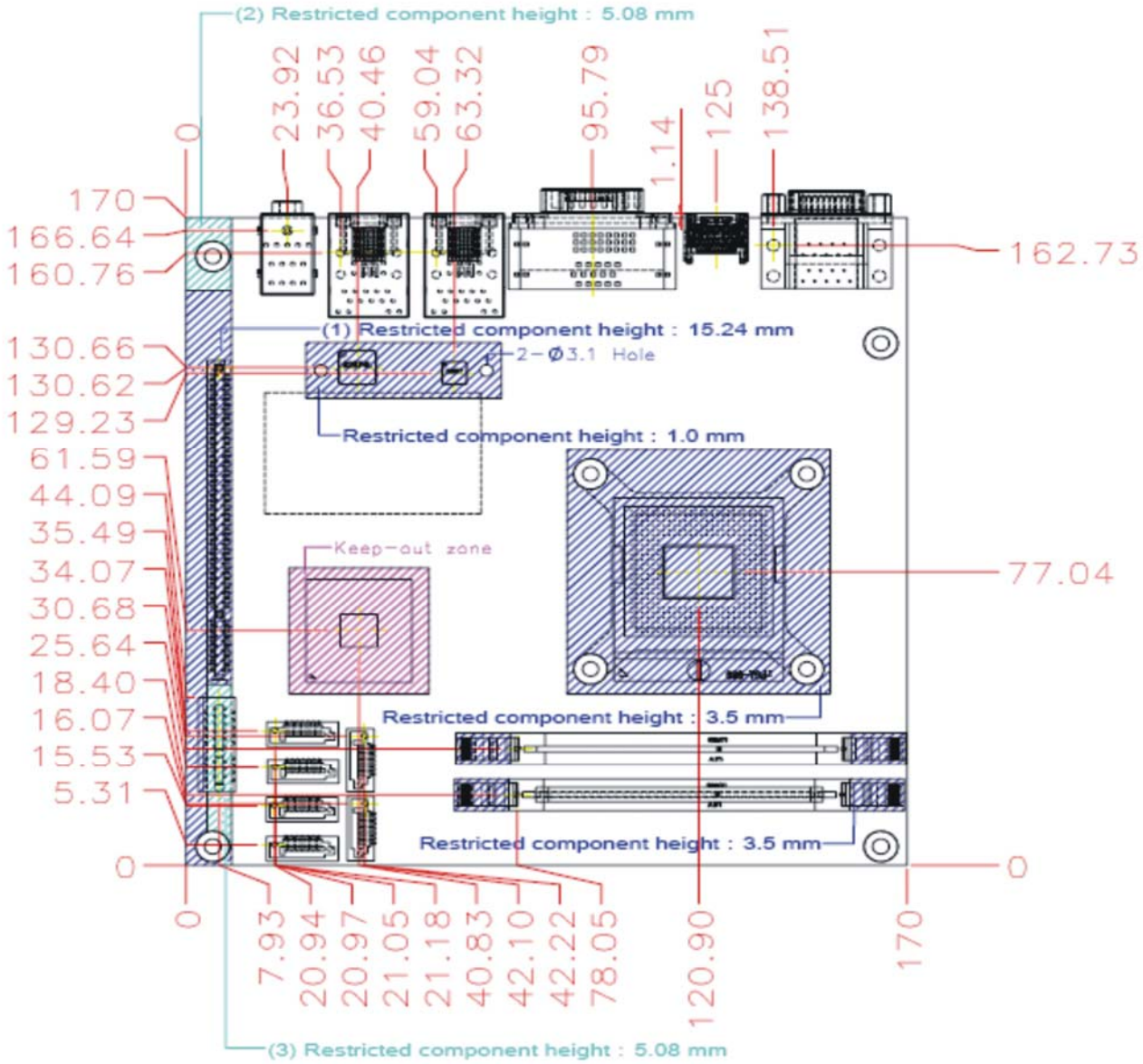
- **Cooling Fans**
  Support one 3-pin power connector for CPU cooler and one 3-pin power connector for system fan
- **System Monitoring Feature**
  Monitor system temperature and major power sources.
- **Outline Dimension (L x W)**
  170mm(6.69'') x 170mm(6.69'')
- **Power Requirements**
  Configuration

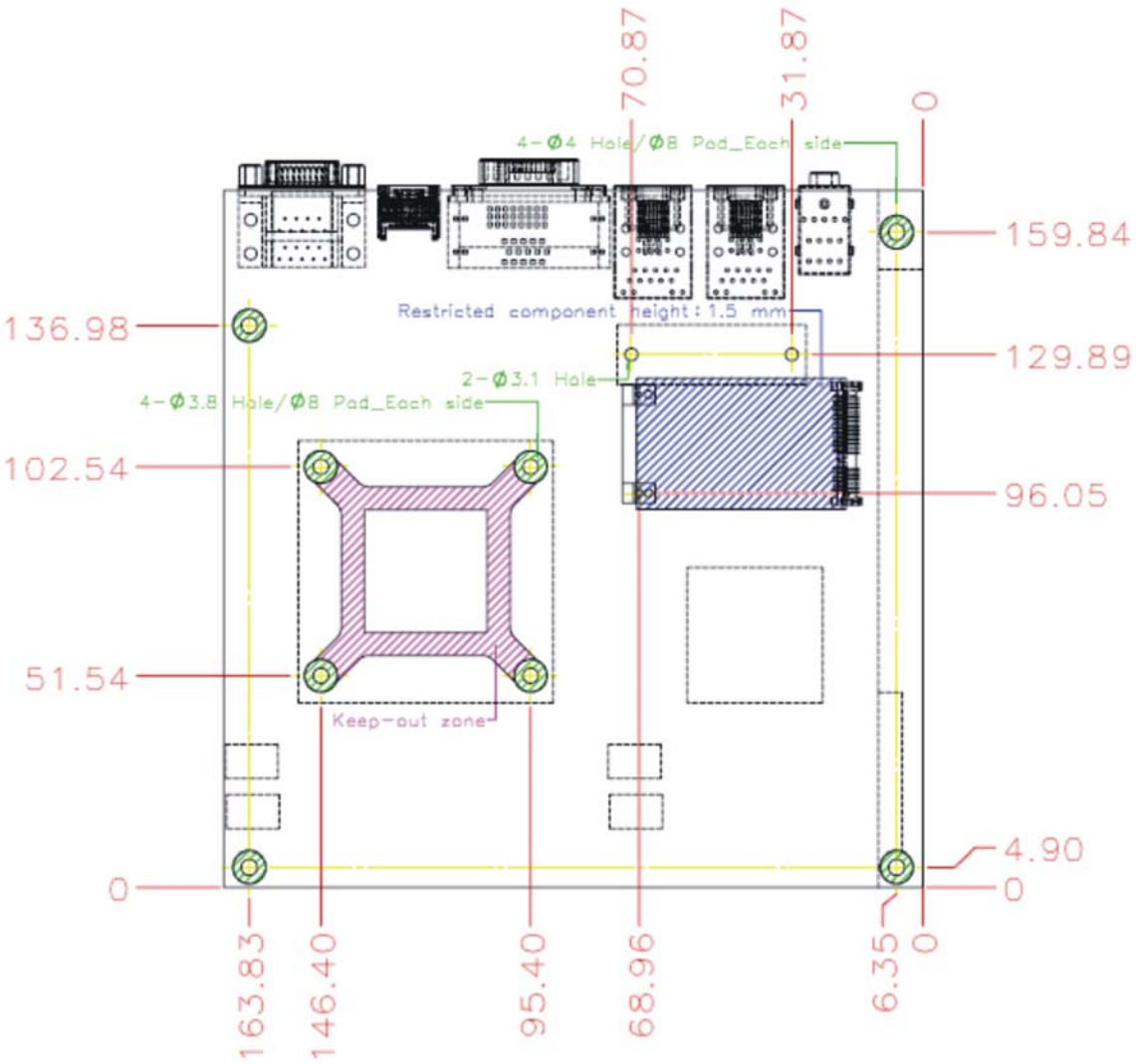
CPU Type	Intel® Core™ i5 CPU M520 @2.4GHz L3:3MB Bus Speed:133MHz
SBC BIOS	Portwell,Inc. WADE-8020 BIOS Rev.:R1.00.E0(09012010)
Memory	Transcend DDR3 1066 1GB (ELPIDA J1108BDBG-DJ-F)
VGA Card	Onboard Intel® QM57
VGA Driver	Intel® Graphics Media Accelerator HD Version 6.14.10.5789
LAN Card	Onboard Intel® 82574L Gigabit Network Connection
LAN Driver	Intel® 82574L Gigabit Network Connection Version 11.4.7.0
LAN Card	Onboard Intel® 82577LML Gigabit Network Connection
LAN Driver	Intel® 82577LML Gigabit Network Connection Version 11.5.10.0
Audio Card	Onboard Realtek ALC888 Audio
Audio Driver	Realtek High Definition Audio Version 5.10.0.6043
Chip Driver	Intel® Chipset Devices Software Version 9.1.1.1025
USB 2.0 Driver	Intel® 5 series/3400 Series Chipset Family USB Enhanced Host Controller Version 9.1.1.1013
SATA HDD	Seagate ST3160815AS 160GB
CDROM	LITE-ON LH-20A1S DVD-ROM
Power Supply	FSP350-60GLC

Item	Power ON	Full Loading 10Min	Full Loading 30Min
CPU +12V	0.94	1.23	1.25
System +12V	0.30	0.33	0.33
System +5V	3.31	3.49	3.55

- **Operating Temperature**
  0 °C ~ 60 °C
- **Storage temperature**
  -20 ~ 80 °C
- **Relative Humidity**
  0% ~ 90%, non-condensing

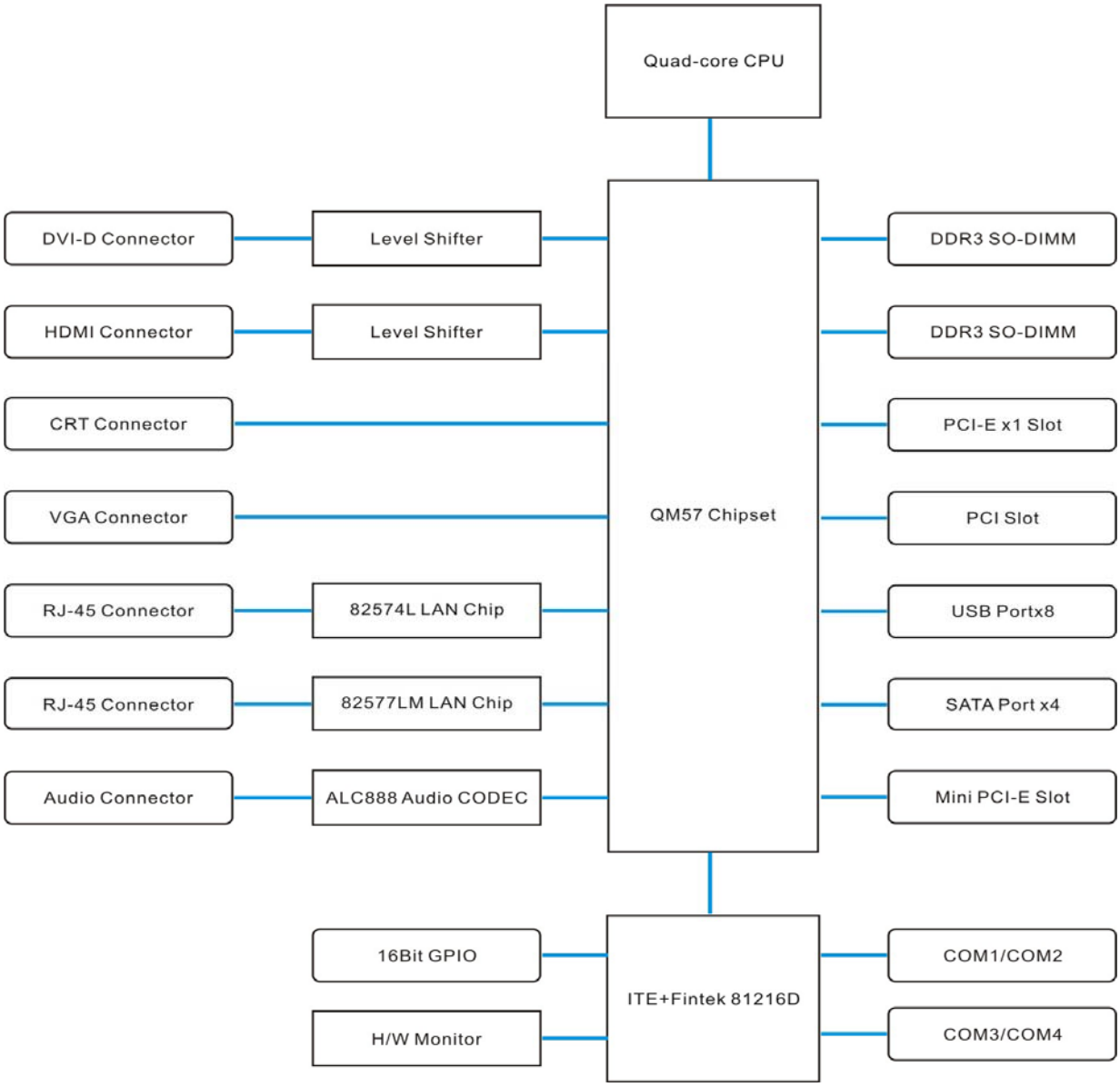
1.3.1 Mechanical Drawing




70.87
31.87
0
4-Ø4 Hole/Ø8 Pad_Each side
159.84
136.98
Restricted component height: 1.5 mm
129.89
2-Ø3.1 Hole
4-Ø3.8 Hole/Ø8 Pad_Each side
102.54
96.05
51.54
Keep-out zone
4.90
0
0
163.83
146.40
95.40
68.96
6.35
0

1.4 System Architecture

All of details operating relations are shown in WADE-8020 System Block Diagram.

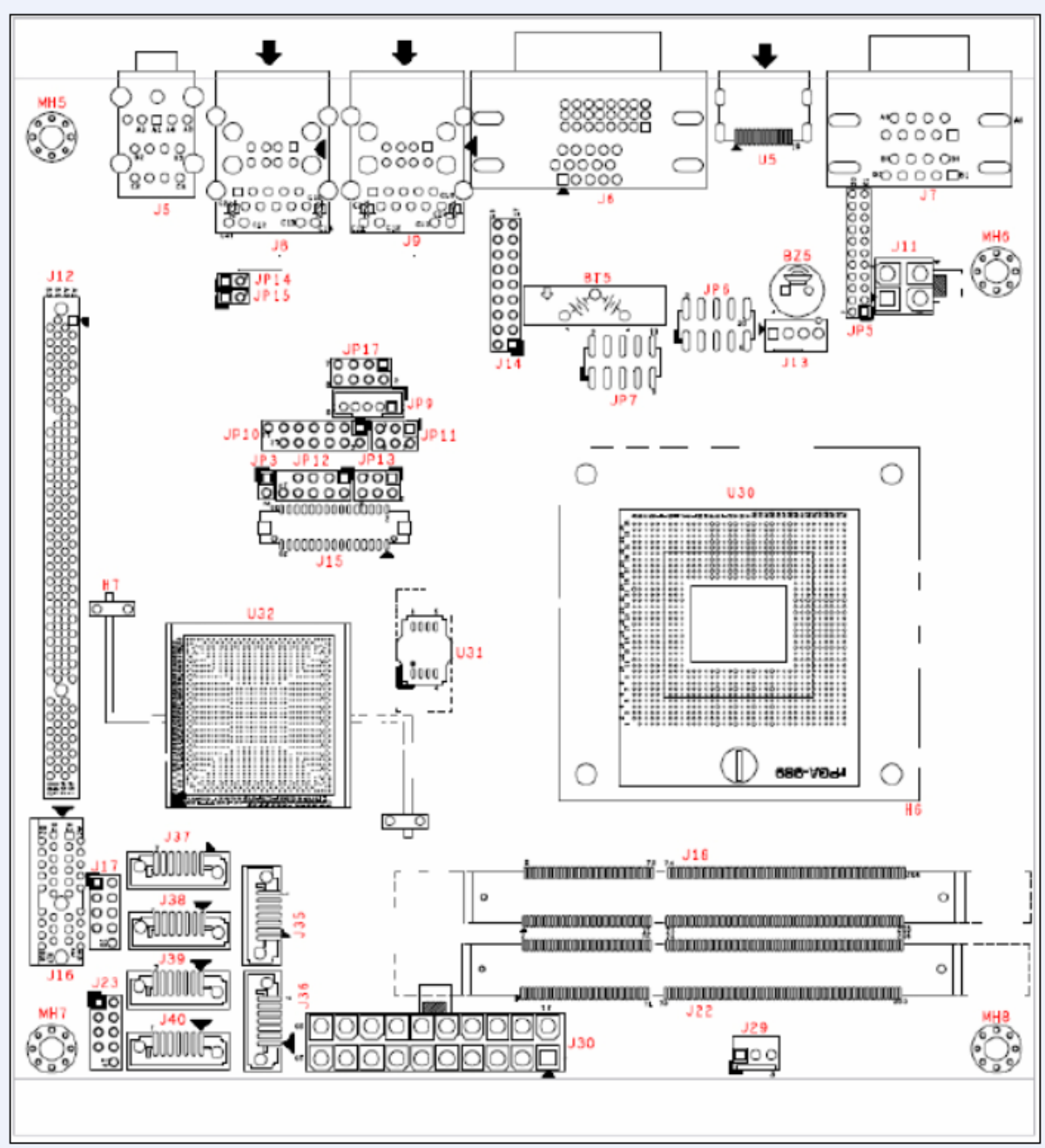


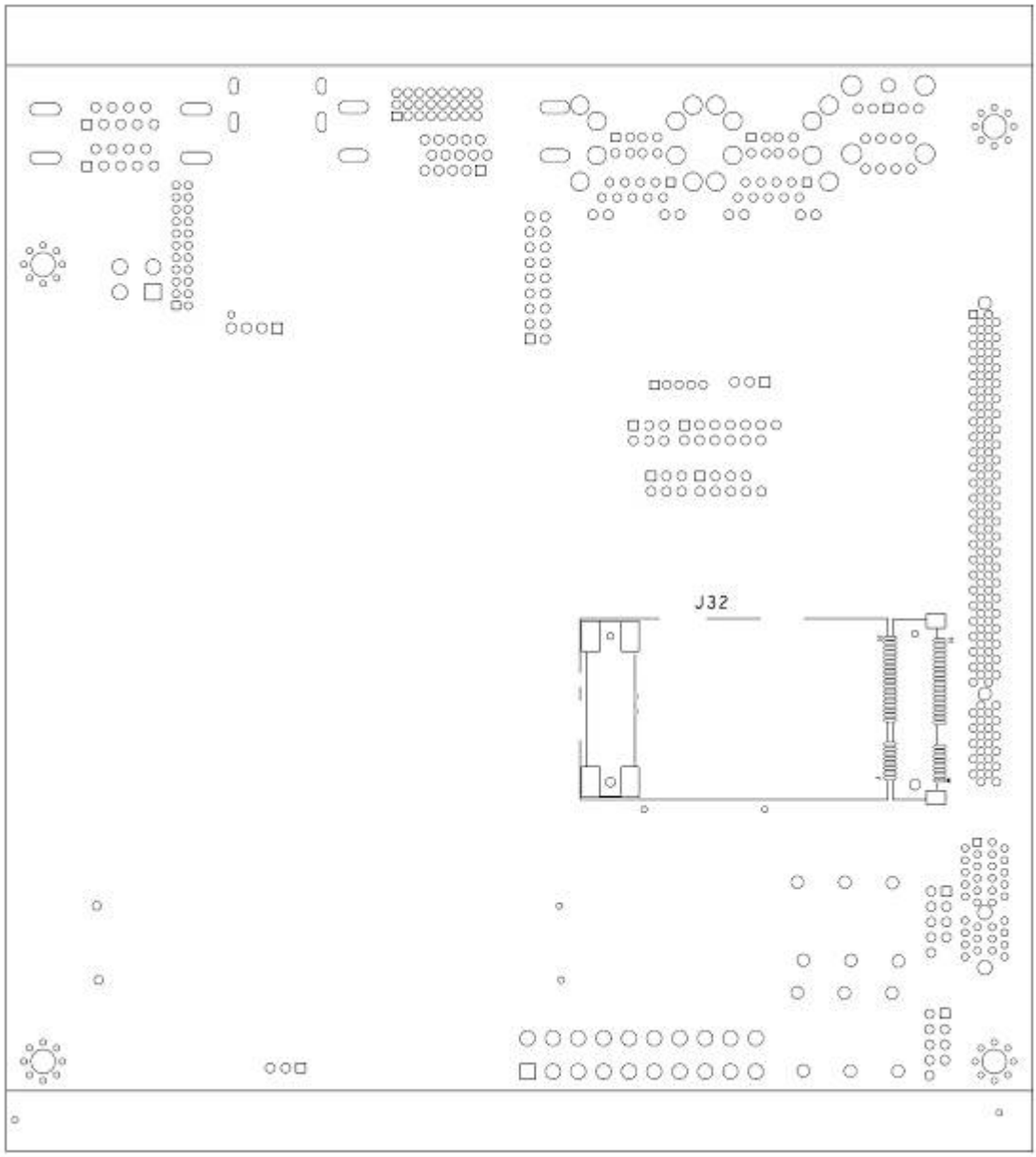
WADE-8020 System Block Diagram

Chapter 2
Hardware Configuration

This chapter indicates jumpers', headers' and CONNECTORs' locations. Users may find useful information related to hardware settings in this chapter.

2.1 Jumper Setting





The jumper settings are schematically depicted in this manual as follows:

JP5: COM2 RS232, 422, 485 Selection

JP5	Function
5-6,9-11,10-12,15-17,16-18 Short	RS-232 ★
3-4,7-9,8-10,13-15,14-16,21-22 Short	RS-422
1-2,7-9,8-10,19-20 Short	RS-485

JP13: VDDLVDS_IN Selection

JP13	Function
1-3 Short	VCC3 ★
3-5 Short	VCC
3-4 Short	+12V

JP15: CMOS Clear Header

JP15	Function
1-2 Open	Normal Operation ★
1-2 Short	Clear CMOS Contents

JP14 ME RTC Clear Header

JP14	Function
1-2 Open	Normal Operation ★
1-2 Short	CLEAR ME RTC REGISTER

2.2 Connector Allocation

I/O peripheral devices are connected to the interface connectors.

Connector Function List

Connector	Function	Remark
JP6	COM3 Pin Header	
JP7	COM4 Pin Header	
JP9	Backlight POWER CONNECTOR	
JP10	Front Panel Pin Header	
JP11	LVDS Backlight VDD SETTING	
JP12	LPC Debug Pin header	
J5	AUDIO CONNECTOR	
J6	VGA+DVI CONNECTOR	
J7	COM1+COM2 NNECTOR	
J8	USBX2 + LAN CONNECTOR	
J9	USBX2 + LAN CONNECTOR	
J11	ATX 4P CONNECTOR	
J12	PCI CONNECTOR	

J13	CPU FAN CONNECTOR	
J14	16-bit GPIO Pin Header	
J15	LVDS CONNECTOR	
J16	PCI-E X1 SLOT	
J17	USBx2 Pin Header	
J18	DDR3 SODIMM SOCKET	
J19	SATA CONNECTOR	
J20	SATA CONNECTOR	
J21	SATA CONNECTOR	
J22	DDR3 SODIMM SOCKET	
J23	USBx2 Pin Header	
J25	SATA CONNECTOR	
J26	SATA CONNECTOR	
J27	SATA CONNECTOR	
J29	SYSTEM FAN CONNECTOR	
J30	ATX 20P CONNECTOR	
J32	Mini-PCI-E CONNECTOR	

Pin Assignments of Connectors

JP6: COM3 Pin Header

Pin No.	Signal Description
1	DCD#
2	DSR#
3	RXD#
4	RTS#
5	TXD#
6	CTS#
7	DTR#
8	RI#
9	GND
10	NC

JP7: COM4 Pin Header

Pin No.	Signal Description
1	DCD#
2	DSR#
3	RXD#
4	RTS#
5	TXD#
6	CTS#
7	DTR#
8	RI#
9	GND
10	NC

JP8: SM Bus Pin Header

Pin No.	Signal Description
1	SMB_CLK
2	SMB_DATA
3	GND

JP9: Backlight POWER CONNECTOR

Pin No.	Signal Description
1	ENABLE
2	GND
3	+12V
4	GND
5	VCC

JP10: Front Panel Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	VCC	2	Power on LED
3	HD_LED#	4	GND
5	GND	6	PWRBTN
7	RESET#	8	GND
9	NC	10	NC
11	GND	12	GND
13	VCC	14	KEY

JP11: LVDS Backlight VDD SETTING

Pin No.	Signal Description
1-3, 2-4	5V, Active High
1-3, 4-6	12V, Active High
3-5,2-4	5V, Active Low
3-5,4-6	12V, Active Low

JP12: LPC Debug Pin header

PIN No.	Signal Description	PIN No.	Signal Description
6	LAD0	1	VCC3
7	LAD1	2	PLT_RST#
8	LAD2	3	LFRAME#
9	LAD3	4	CLOCK
10	KEY	5	GND

J13: CPU Fan connector

Pin No.	Signal Description
1	GND
2	+12V
3	SENSE
4	PWM_CONTROL

J14: 16-bit GPIO

PIN No.	Signal Description	PIN No.	Signal Description
1	GPIO11	2	GPIO32
3	GPIO12	4	GPIO33
5	GPIO30	6	GPIO36
7	GPIO31	8	GPIO37
9	GPIO70	10	GPIO74
11	GPIO71	12	GPIO75
13	GPIO72	14	GPIO76
15	GPIO73	16	GPIO77
17	GND	18	VCC

J15: LVDS CONNECTOR

Pin No.	Signal Description	Pin No.	Signal Description
2	VDD	1	VDD
4	LVDSA_DATA#0	3	LVDSA_DATA0
6	LVDSA_DATA#1	5	LVDSA_DATA1
8	LVDSA_DATA#2	7	LVDSA_DATA2
10	LVDSA_DATA#3	9	LVDSA_DATA3
12	LVDSA_CLKN	11	LVDSA_CLKP
14	LVDS_DDC_DATA	13	LVDS_DDC_CLK
16	GND	15	GND
18	LVDSB_DATA#0	17	LVDSB_DATA0
20	LVDSB_DATA#1	19	LVDSB_DATA1
22	LVDSB_DATA#2	21	LVDSB_DATA2
24	LVDSB_DATA#3	23	LVDSB_DATA3
26	LVDSB_CLKN	25	LVDSB_CLKP
28	NC	27	NC
30	GND	29	GND

J29: SYS FAN CONNECTOR

Pin No.	Signal Description
1	GND
2	PWM_CONTROL
3	SENSE

J17 & J23: USBx2 Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	VCC	2	VCC
3	DATA -	4	DATA -
5	DATA +	6	DATA +
7	GND	8	GND
9	KEY	10	GND

J30 : ATX Power Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON#
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWR_OK	18	NC
9	+5VSB	19	+5V
10	+12V1	20	+5V

Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel® i7/i5/P4500 PGA

WADE-8020 has equipped the most advanced Intel® Core™ i5/i7 series CPUs which has built-in Intel® HD Graphics Controller providing a total solution of multi-purpose operation. Furthermore, the leading-edge Intel® Core™ processor delivers unmatched technology for intelligent performance on the most demanding tasks, such as creating digital video and playing intense games. With building into WADE-8020 Mini-ITX board computer, it can be applied in many different uses depending on the configurations of system setup.

Support List
Intel® Core™ i7-820QM Processor
Intel® Core™ i7-620M Processor
Intel® Core™ i5-520M Processor
Intel® Celeron® Processor P4500

3.2 Main Memory

WADE-8020 provides 2 x 204-pin SO-DIMM sockets which supports dual channel DDR3 800/1066 MHz SDRAM as main memory. The maximum memory size can be up to 8GB capacity.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be either one double-sided DIMM in either one DIMM socket or two single-sides SO-DIMM in both sockets.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

Dual Channel DDR3 SO-DIMM
Dual Channel DDR3 memory technology doubles the bandwidth of memory bus. Adequate or higher bandwidth of memory than processor would increase system performance. To enable Dual Channel DDR3 memory technology, you have to install dual identical memory modules in both memory sockets. Following tables show bandwidth information of different processor and memory configurations.

CPU FSB	Bandwidth
1066MHz	8.5GB/s
800MHz	6.4GB/s

Memory Frequency	Dual Channel DDR Bandwidth
1066MHz	17GB/s
800MHz	12.8GB/s

Note:
To insure the system stability, please do not change any of DRAM parameters in BIOS setup to modify system the performance without acquiring technical information

3.3 Installing the Mini-ITX Board Computer

To install your WADE-8020 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place WADE-8020 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

Note:
Please refer to section 3.3.1 to 3.3.4 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

WADE-8020 uses state-of-art Intel® QM57 chipset. It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows XP/Vista/Win7, please install its INF before any of other Drivers are installed. You can find this chipset component driver very easily in installation CD of WADE-8020.

3.3.2 Intel® Integrated HD Graphics Controller

Unlike the other structure, WADE-8020 has integrated HD Graphics derived from Intel® Core™ series CPU (i5/i7) technology. It is the most advanced design to gain an outstanding graphic processing performance in a compact size. Support DVMT/Fixed mode for integrated graphic memory size up to the maximum DDR3-SDRAM capacity. WADE-8020 supports VGA, DVI-D, HDMI, and integrated LVDS display output. This combination makes WADE-8020 an excellent piece of multimedia workstation.

With no additional video adaptor, this onboard graphic controller will be the primary system graphic processing handler. By adjusting the BIOS setting to disable on-board VGA, an add-on PCI-Express graphic card can take over the system display.

Drivers Support
Please find all the drivers in the installation CD of WADE-8020. Drivers support Windows XP/Vista/Win7.

3.3.3 Intel Gigabit Ethernet Controller

WADE-8020 equips with Intel® 82574L and Intel® 82577LM Gigabit Ethernet controllers technologies through PCI Express bus route that give you a premium

networking experience. Intel® 82577LM supports iAMT 6.0 providing built-in manageability for your system.

Operation of Ethernet Port
WADE-8020 provides two LED indicators on each port to report Gigabit Ethernet interface status. Please refer to the table below as a quick reference guide.

<table>
<tr><th rowspan="2">82574L/82577LM</th><th rowspan="2">Color</th><th rowspan="2">Name of LED</th><th colspan="3">LED Indicator</th></tr>
<tr><td colspan="2">Linked</td><td>Active</td></tr>
<tr><td>Status LED</td><td>Green</td><td>LAN Linked & Active</td><td colspan="2">On</td><td>Blinking</td></tr>
<tr><td rowspan="2">Speed LED</td><td>Orange</td><td rowspan="2">LAN Speed</td><td>Giga Mbps</td><td>100 Mbps</td><td>10 Mbps</td></tr>
<tr><td>Green</td><td>Orange</td><td>Green</td><td>Off</td></tr>
</table>

Drivers Support
Please find INTEL 82574L and 82577LM LAN driver in installation CD of WADE-8020. The drivers support Windows XP/Vista/Win7.

3.3.4 Audio Controller

Drivers Support
Please find Intel® High Definition Audio driver in installation CD of WADE-8020. The drivers support Windows XP/Vista/Win7.

3.3.5 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function by putting jumpers at proper position.

JP14: ME RTC Clear Header
JP15: CMOS Clear Header

JP14 ME RTC Clear Header

JP11	Function
1-2 Open	Normal Operation ★
1-2 Short	CLEAR ME RTC REGISTER

JP15: CMOS Clear Header

JP15	Function
1-2 Open	Normal Operation ★
1-2 Short	Clear CMOS Contents

3.4 GPIO

The WADE-8020 provides 16 programmable input or output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of

I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

3.4.1 Pin assignment

J14: 16-bit GPIO

PIN No.	Signal Description	PIN No.	Signal Description
1	GPIO11	2	GPIO32
3	GPIO12	4	GPIO33
5	GPIO30	6	GPIO36
7	GPIO31	8	GPIO37
9	GPIO70	10	GPIO74
11	GPIO71	12	GPIO75
13	GPIO72	14	GPIO76
15	GPIO73	16	GPIO77
17	GND	18	VCC

All General Purpose I/O ports can only apply to standard VCC3=3.3 ± 5% signal level (0V/3.3V), and each source sink capacity up to 8mA.

3.4.2 WADE-8020 GPIO Programming Guide

There are 16 GPIO pins on WADE-8020. These GPIO pins are from SUPER I/O (IT8721FF) GPIO pins, and can be programmed as Input or Output direction.

J14 pin header is for 16 GPIO pins and its pin assignment as following :

J14_Pin1 from SUPER I/O_GPIO11 with Ext. 4.7K PH
J14_Pin2 from SUPER I/O_GPIO32 with Ext. 4.7K PH
J14_Pin3 from SUPER I/O_GPIO12 with Ext. 4.7K PH
J14_Pin4 from SUPER I/O_GPIO33 with Ext. 4.7K PH
J14_Pin5 from SUPER I/O_GPIO30 with Ext. 4.7K PH
J14_Pin6 from SUPER I/O_GPIO36 with Ext. 4.7K PH
J14_Pin7 from SUPER I/O_GPIO31 with Ext. 4.7K PH
J14_Pin8 from SUPER I/O_GPIO37 with Ext. 4.7K PH
J14_Pin9 from SUPER I/O_GPIO70 with Ext. 4.7K PH
J14_Pin10 from SUPER I/O_GPIO74 with Ext. 4.7K PH
J14_Pin11 from SUPER I/O_GPIO71 with Ext. 4.7K PH
J14_Pin12 from SUPER I/O_GPIO75 with Ext. 4.7K PH
J14_Pin13 from SUPER I/O_GPIO72 with Ext. 4.7K PH
J14_Pin14 from SUPER I/O_GPIO76 with Ext. 4.7K PH
J14_Pin15 from SUPER I/O_GPIO73 with Ext. 4.7K PH
J14_Pin16 from SUPER I/O_GPIO77 with Ext. 4.7K PH

<<<<< Be careful Pin17=GND , Pin18=VCC >>>>>

There are several Configuration Registers (CR) of IT8721FF needed to be programmed to control the GPIO direction, and status(GPI)/value(GPO). 25h ~ 29h are common (global) registers to all Logical Devices (LD) in IT8721F. LDN=07h contains the Logical Device Number that can be changed to access the LD as needed. LD7 contains the GPIO11,32,12,33,30,36,31,37 registers.

Programming Guide
For example,
LD7_CR25h_Bit1.P1; Let Function select GPIO11
LD7_CRC0h_Bit1.P1; Let GPIO11 as Simple I/O Function
LD7_CRC8h_Bit2.P1; Let GPIO12 as Output
LD7_CRCAh_Bit3.P0; Let GPIO33 as Input

How to access IT8721F CR?

In WADE-8020, the Test 1 = 002Eh, and Test 2 = 002Fh.
Test 1 and Test 2 are 2 IO ports needed to access IT8721F CR.
Test 1 is the Index Port, Test 2 is the Data Port.
CR index number needs to be written into Test 1 first,
Then the data will be read/written from/to Test 2.

To R/W IT8721F CR, it is needed to Enter/Enable Configuration Mode first.
When completing the programming, it is suggested to Exit/Disable Configuration Mode.

Enter Configuration Mode: Write 87h to IO port Test 1 twice.
Exit Configuration Mode: Set bit 1 of the configure control register (index=02h) to "1" to exit.

3.4.3 Example

```
.model small
.stack
.data
string1 db 'SIO is not IT8721F (2E,2F)', 0ah, 0dh ,'$'
string2 db 'Test Fail', 0ah, 0dh ,'$'
string3 db 'Test Pass', 0ah, 0dh ,'$'
string4 db 'Only test for WADE-8020 GPIO ', 0ah, 0dh ,'$'

.code
pgm:
mov     ax, @data
mov     ds, ax

mov dx,offset string4
mov ah,09h
int 21h


mov     dx, 2eh                 ; enter MB PnP mode in 2Eh
mov al, 87h
out     dx, al
mov al, 01h
out dx, al
mov al, 55h
out dx, al
mov al, 55h
out dx, al

mov al, 20h                     ; read the Chip ID to check the address of SIO
out dx, al
inc dx
in  al, dx      ; default =87h
mov bl, al
mov al, 21h
mov dx, 2eh
out dx, al
```

```
inc dx
in  al, dx      ; default =21h
mov bh, al


cmp bx,  2187h                          ;cmp CHIP ID
je                      L1

mov dx,offset string1
mov ah,09h
mov al, 000h
int 21h
jmp L6

L1 :

mov dx, 2eh             ; Switch to LDN=03h
mov al, 07h
out dx, al
inc dx
mov al, 03h
out dx, al

mov dx, 2eh             ; Set F0 bit3=1 ;disable 80 port function
mov al, 0F0h
out dx, al
inc dx
in  al, dx
or  al, 08h
out dx, al


mov dx, 2eh             ; Set 30 bit0=0 ;Set GPIO 7X enable
mov al, 30h
out dx, al
inc dx
and al, 00h
out dx, al

mov dx, 2eh
mov al, 07h     ;Switch to Logic Device 07 & LDN=07h
out dx, al
inc dx
out dx, al
```

```
mov dx, 2eh          ; Set GLPIO 11 12 enable
mov al, 25h
out dx, al
inc dx
mov al, 06h
out dx, al

mov dx, 2eh          ; Set GLPIO 30 31 32 33 36 37 enable
mov al, 27h
out dx, al
inc dx
mov al, 0CFh
out dx, al

mov dx, 2eh                  ; set GPIO 1X function is Simple I/O
mov al, 0C0h
out dx, al
inc dx
mov al, 06h
out dx, al

mov dx, 2eh                  ; set GPIO 3X function is Simple I/O
mov al, 0C2h
out dx, al
inc dx
mov al, 0CFh
out dx, al


mov dx, 2eh                  ; set GPIO 11 12 output
mov al, 0C8h
out dx, al
inc dx
mov al, 06h
out dx, al


mov dx, 2eh                  ; set GPIO 30 31 output
mov al, 0CAh
out dx, al
inc dx
mov al, 03h
out dx, al

mov dx, 2eh                  ; set GPIO 70 71 72 73 output
```

```
mov al, 0CEh
out dx, al
inc dx
mov al, 0Fh
out dx, al

mov dx, 2eh
mov al, 062h
out dx, al
inc dx
;Gasym out al, dx
in al, dx
mov bh, al

mov dx, 2eh
mov al, 063h
out dx, al
inc dx
;Gasym out al, dx
in al, dx
mov bl, al                    ;bx is simple I/O address

mov dx, bx

add dx,02h                    ;Simple I/O address +2 is GPIO 3X state register
in al,dx

and al, 0CCh
cmp al, 00h
jnz L5

add dx,04h                    ;Simple I/O address +2 +4 is GPIO 7X state
register
in al,dx

and al, 0F0h
cmp al, 00h
jnz L5
;;;
```

```
mov al, 00h
out dx, al

mov dx, 2eh                    ; set GPIO 30 31 input and GPIO 32 33 36 37
output
mov al, 0CAh
out dx, al
inc dx
mov al, 0CCh
out dx, al

mov dx, 2eh                    ; set GPIO 70 71 72 73 input and GPIO 74 75 76 77
output
mov al, 0CEh
out dx, al
inc dx
mov al, 0F0h
out dx, al

mov dx,bx                      ;Simple I/O address is GPIO 1X state register
in al,dx
and al, 06h
cmp al, 00h
jnz L5

add dx, 02h                    ;Simple I/O address +2 is GPIO 3X state register
in al, dx
and al, 03h
cmp al, 00h
jnz L5

add dx,04h                     ;Simple I/O address +2 +4 is GPIO 7X state
register
in al,dx
and al, 0Fh
cmp al, 00h
jnz L5

jmp L4

L5 :
mov dx,offset string2
mov ah,09h
int 21h
jmp L6
```

```
L4 :
mov dx,offset string3
mov ah,09h
int 21h

L6:
mov     dx, 2eh
mov     al, 02h
out     dx, al
inc dx
mov al, 02h
out dx, al

exitp:  mov ah, 4ch
int 21h     ;return dos
end pgm
```

Chapter 4
BIOS Setup Information

WADE-8020 uses AMI Aptio BIOS programming stored in Flash ROM. These BIOS has a built-in setup utility program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS EEPROM so that it is retained during power-off periods. When system is turned on, WADE-8020 communicates with peripheral devices and checks its hardware resources with the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

4.1 Entering Setup -- Launch System Setup

Power on the computer and the system will start POST (Power-On-Self-Test) process. When the message below appears on the screen, press <Del> key will enter BIOS setup screen.

Press <Del> or <F2> to enter SETUP

American
Megatrends
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.
Portwell, Inc. WADE-8020 BIOS Rev.:R1.00.E0 (05012010)
Press <DEL> or <F2> to enter setup.

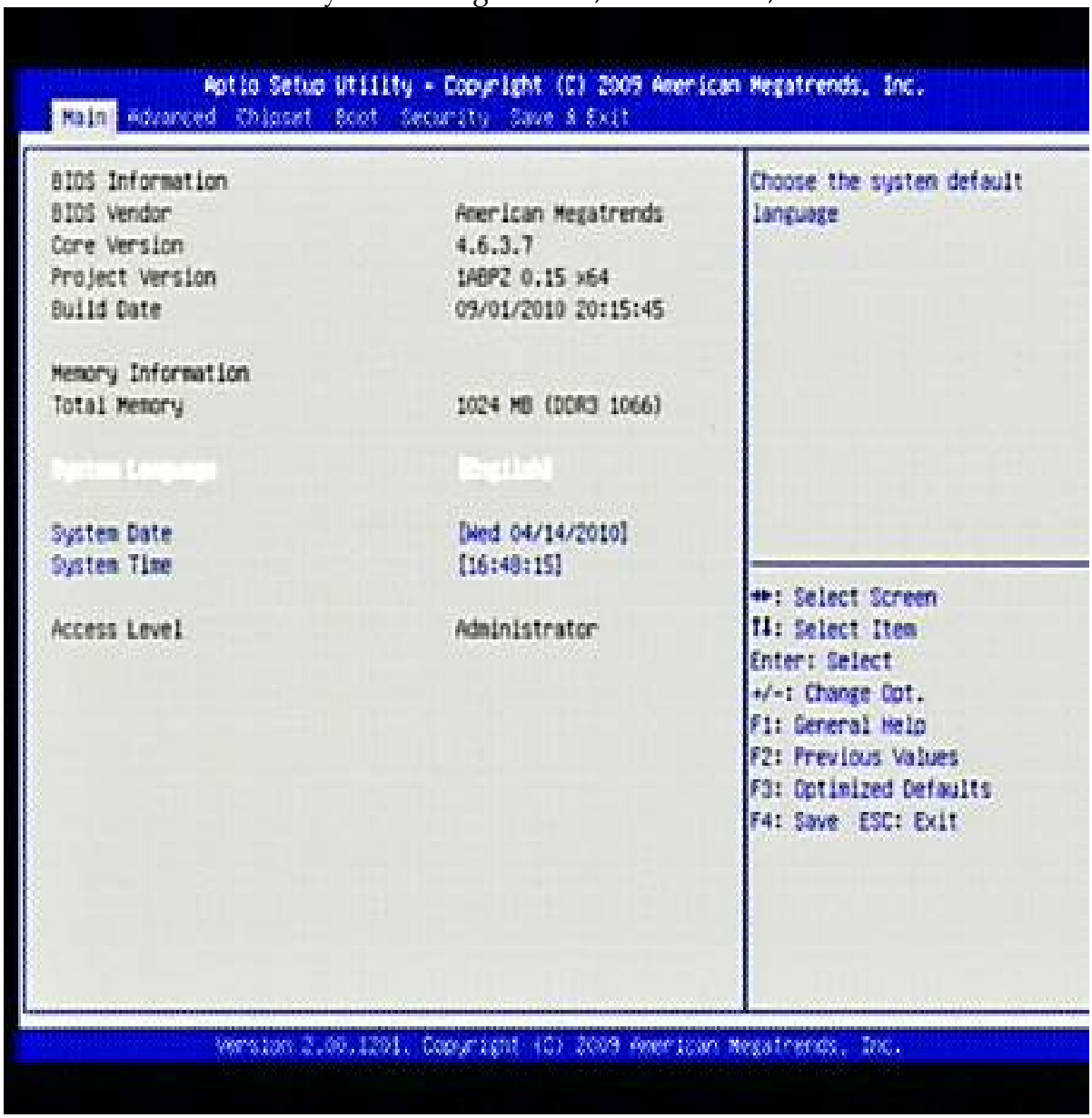
If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible

keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.

4.2 Main

Use this menu for basic system configurations, such as time, date etc.



System Time

The time format is <Hour> <Minute> <Second>. Use [+] or [−] to configure system Time.

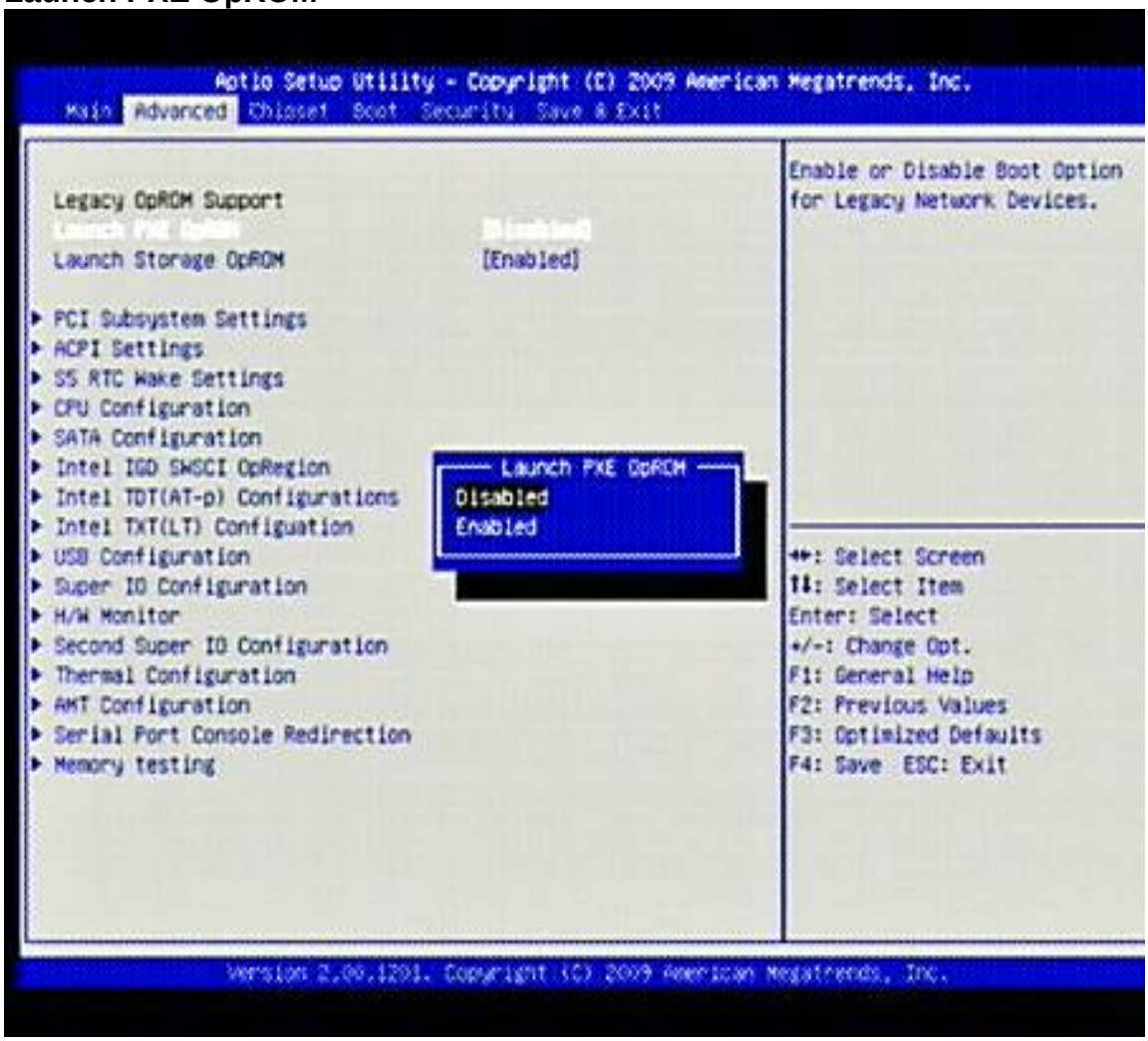
System Date

The date format is <Day>, <Month> <Date> <Year>. Use [+] or [−] to configure system Date.

4.3 Advanced

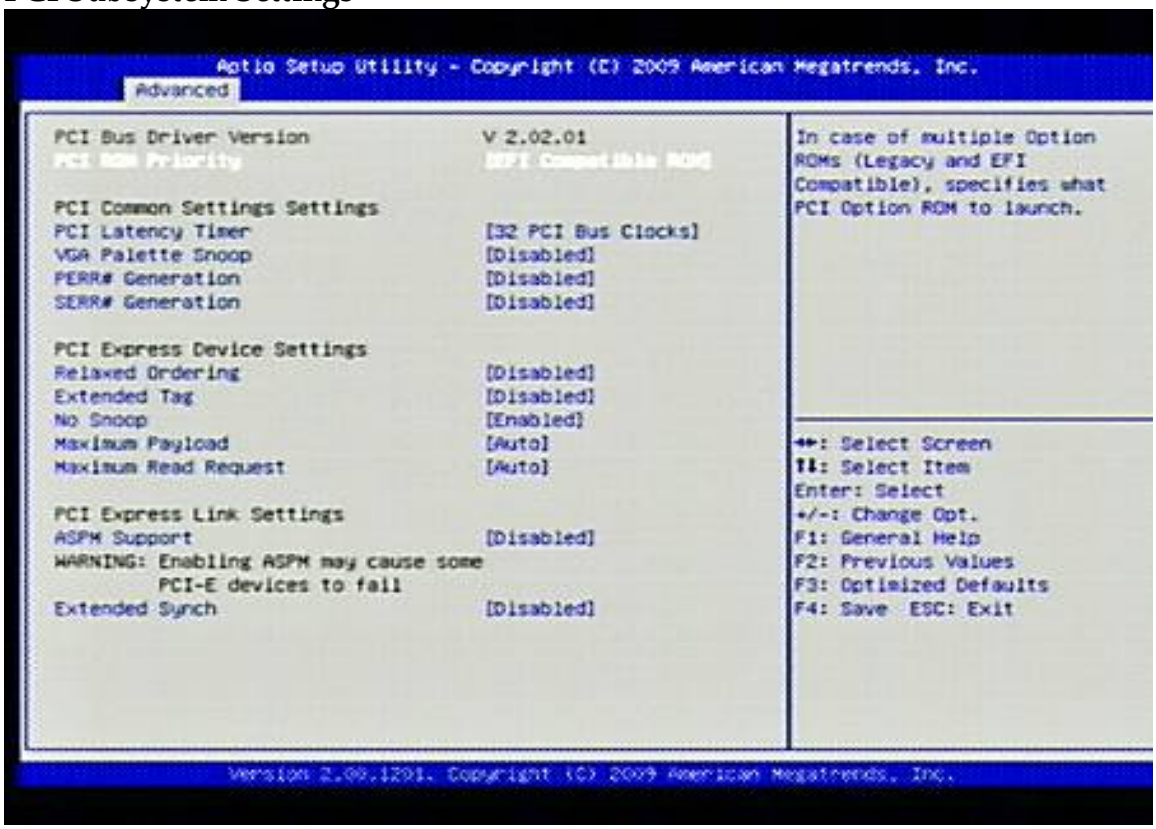
Use this menu to set up the items of special enhanced features.

Launch PXE OpROM

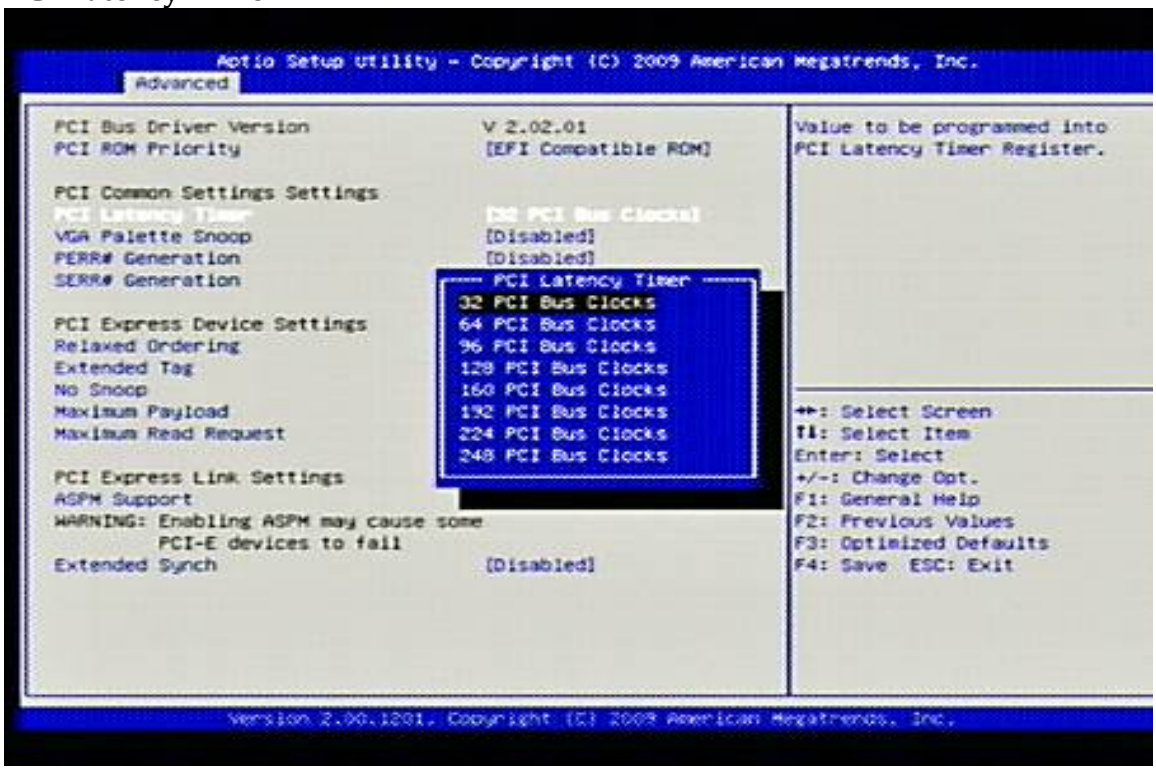


Enable or Disable Boot Option for Lagacy Network Devices.
Choices: Disabled, Enabled

PCI Subsystem Settings

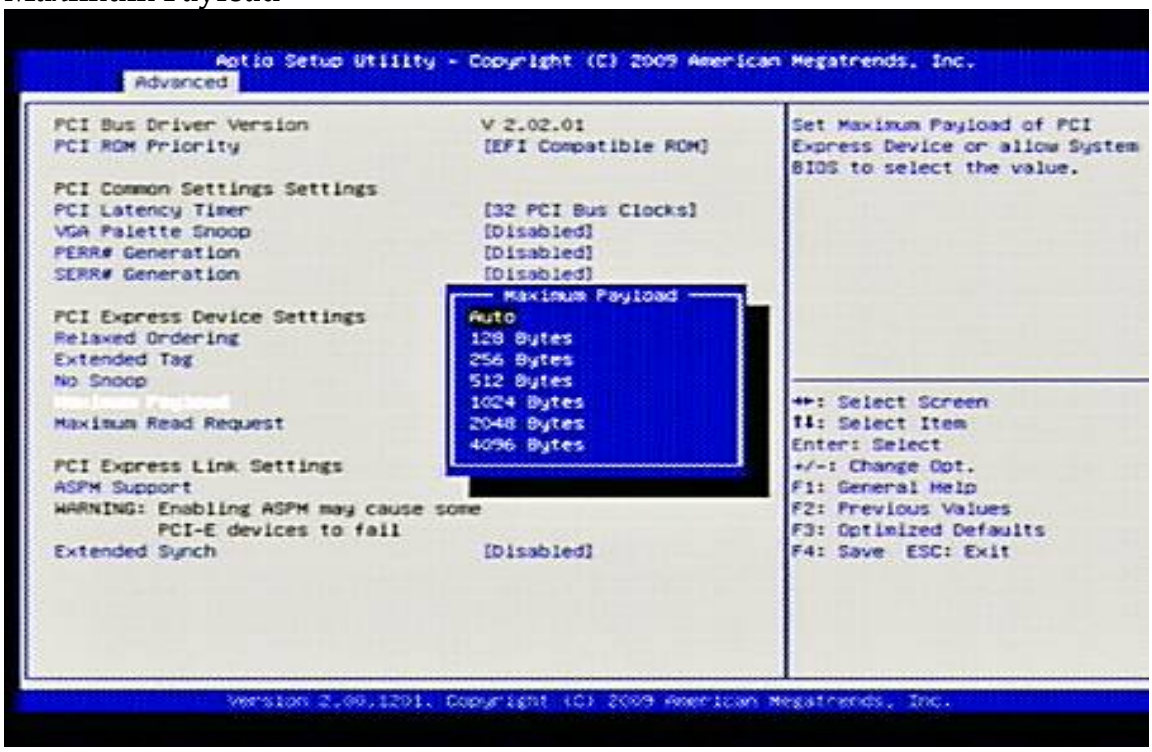

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
PCI Bus Driver Version V 2.02.01
PCI ROM Priority [EFI Compatible ROM]
PCI Common Settings Settings
PCI Latency Timer [32 PCI Bus Clocks]
VGA Palette Snoop [Disabled]
PERR# Generation [Disabled]
SERR# Generation [Disabled]
PCI Express Device Settings
Relaxed Ordering [Disabled]
Extended Tag [Disabled]
No Snoop [Enabled]
Maximum Payload [Auto]
Maximum Read Request [Auto]
PCI Express Link Settings
ASPM Support [Disabled]
WARNING: Enabling ASPM may cause some
PCI-E devices to fail
Extended Synch [Disabled]
In case of multiple Option ROMs (Legacy and EFI Compatible), specifies what PCI Option ROM to launch.
↔: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

PCI Latency Timer



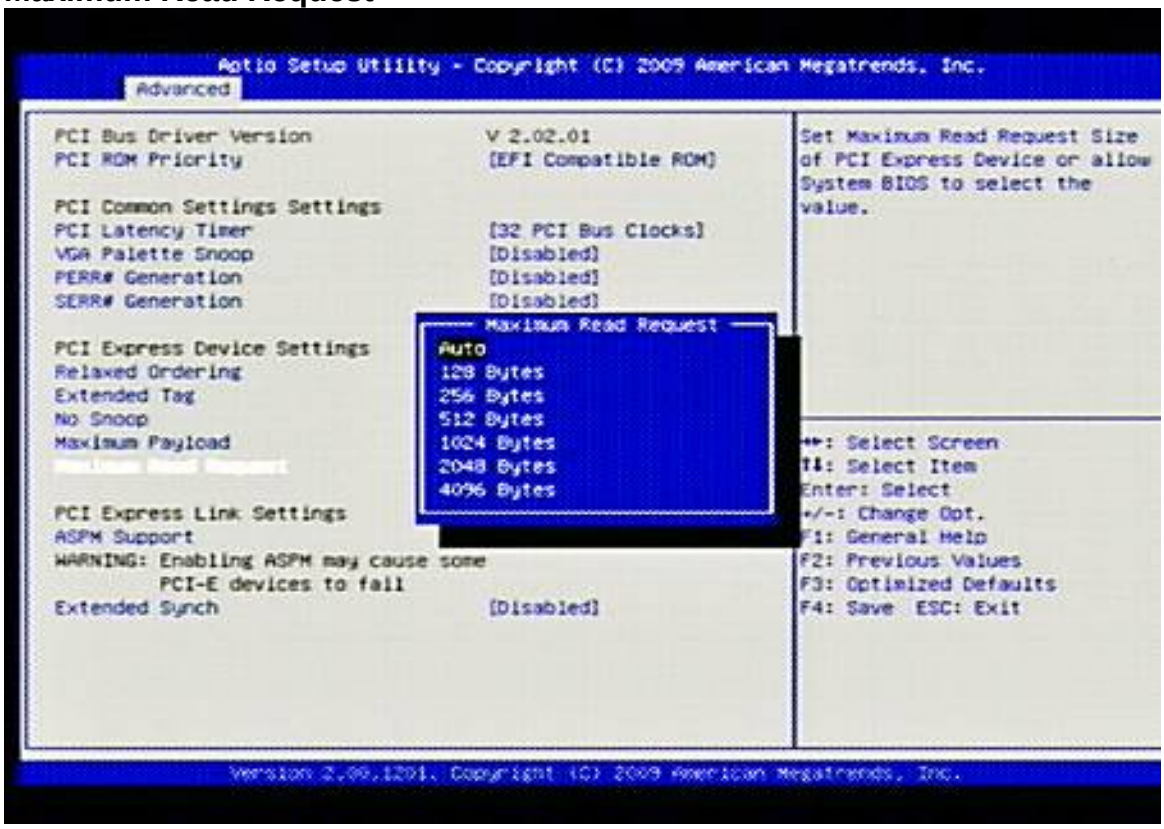
Choices: 32 PCI, 64 PCI, 96 PCI, 128 PCI, 160 PCI, 192 PCI, 224 PCI, 248 PCI Bus Clocks

Maximum Payload



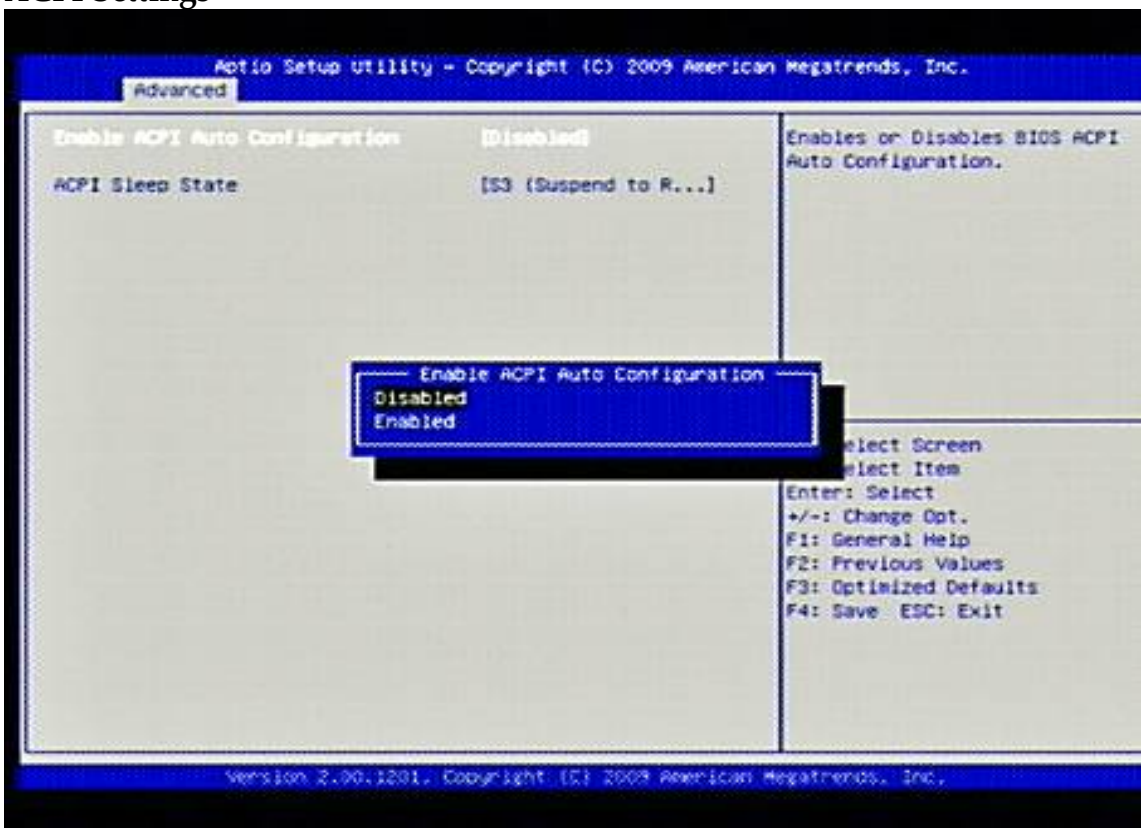
Choices: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes

Maximum Read Request



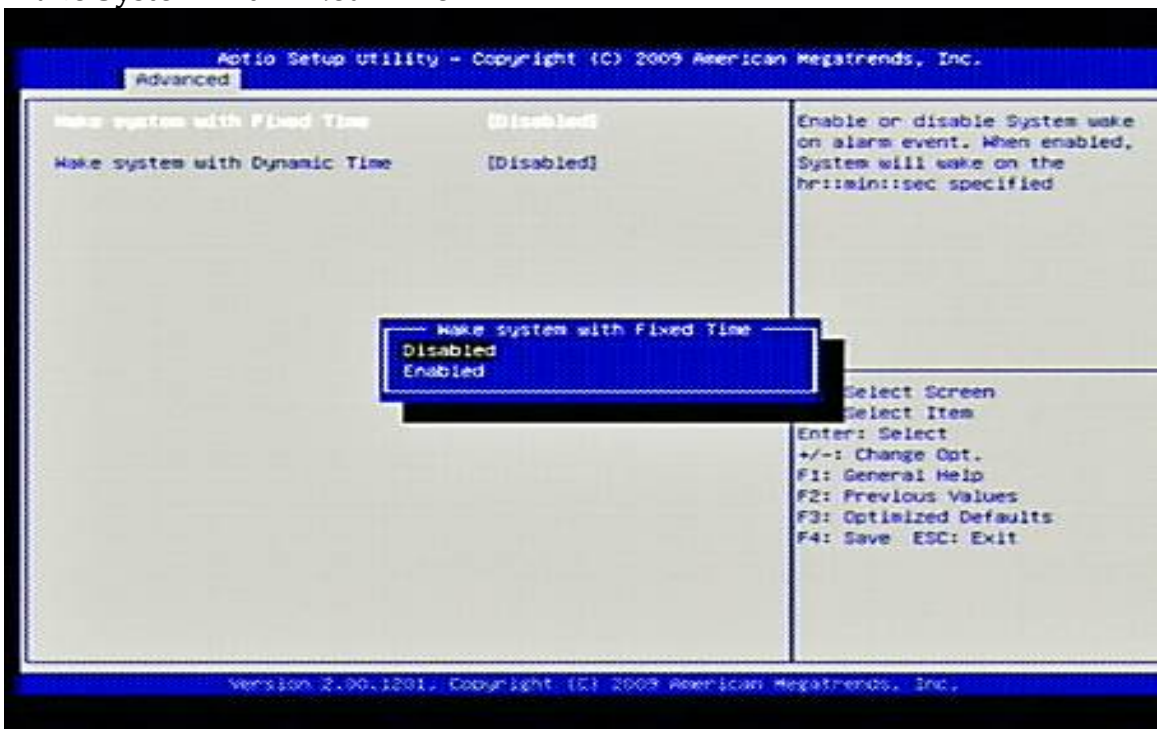
Choices: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes

ACPI Settings


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Enable ACPI Auto Configuration [Disabled]
ACPI Sleep State [S3 (Suspend to R...]
Enables or Disables BIOS ACPI Auto Configuration.
Enable ACPI Auto Configuration
Disabled
Enabled
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

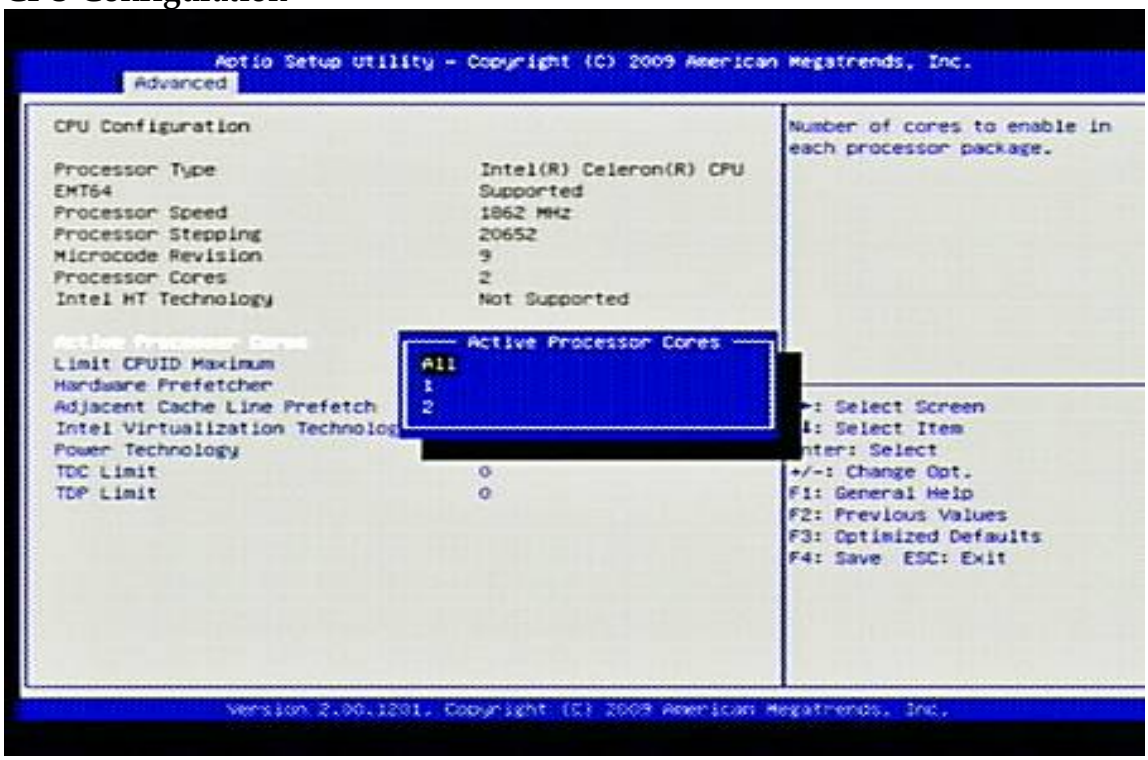
Choices: Enabled, Disabled.

Wake System with Fixed Time


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Wake system with Fixed Time [Disabled]
Wake system with Dynamic Time [Disabled]
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified
Wake system with Fixed Time
Disabled
Enabled
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

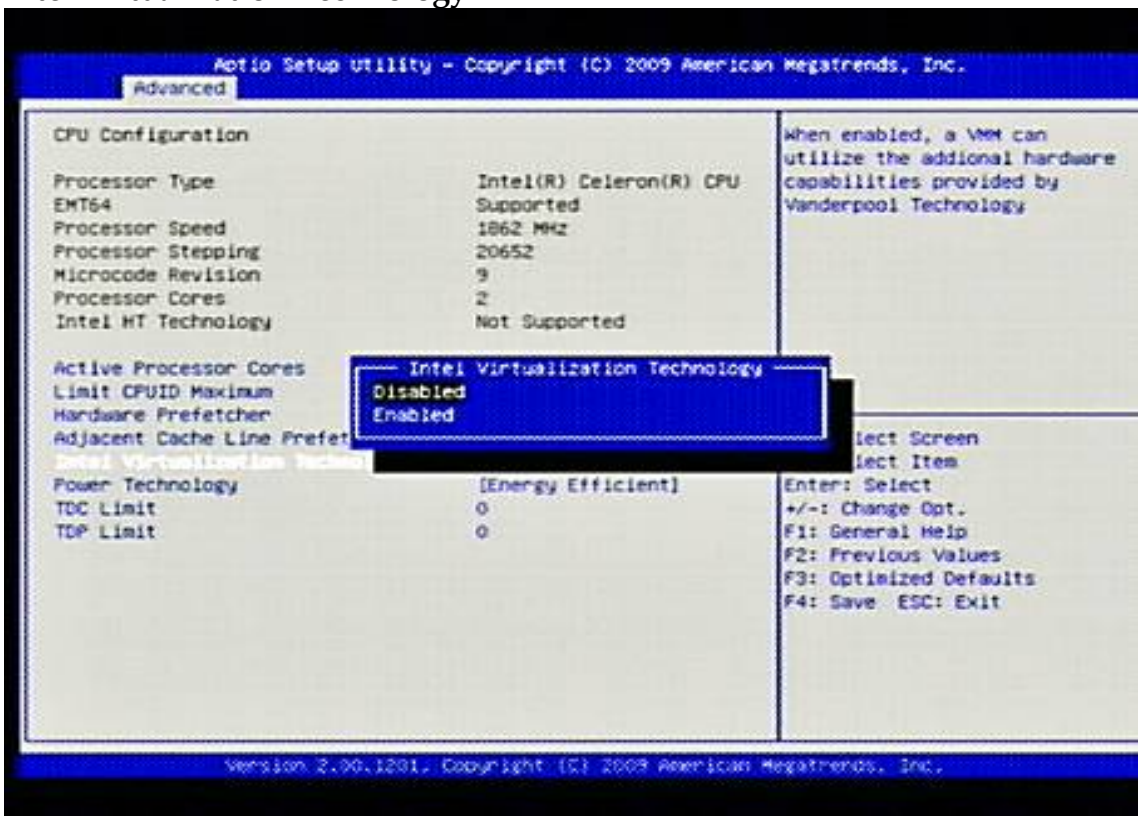
Choices: Disabled, Enabled

CPU Configuration



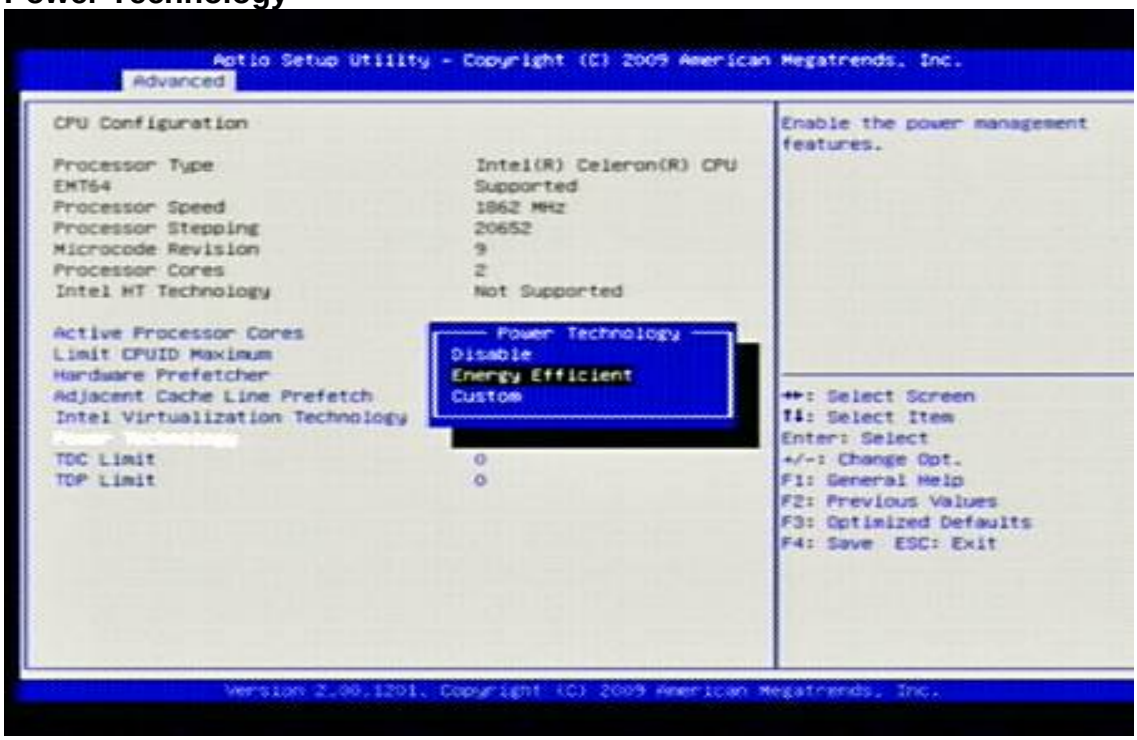
Items marking as black show the detailed specifications of your CPU. Read only.

Intel Virtualization Technology



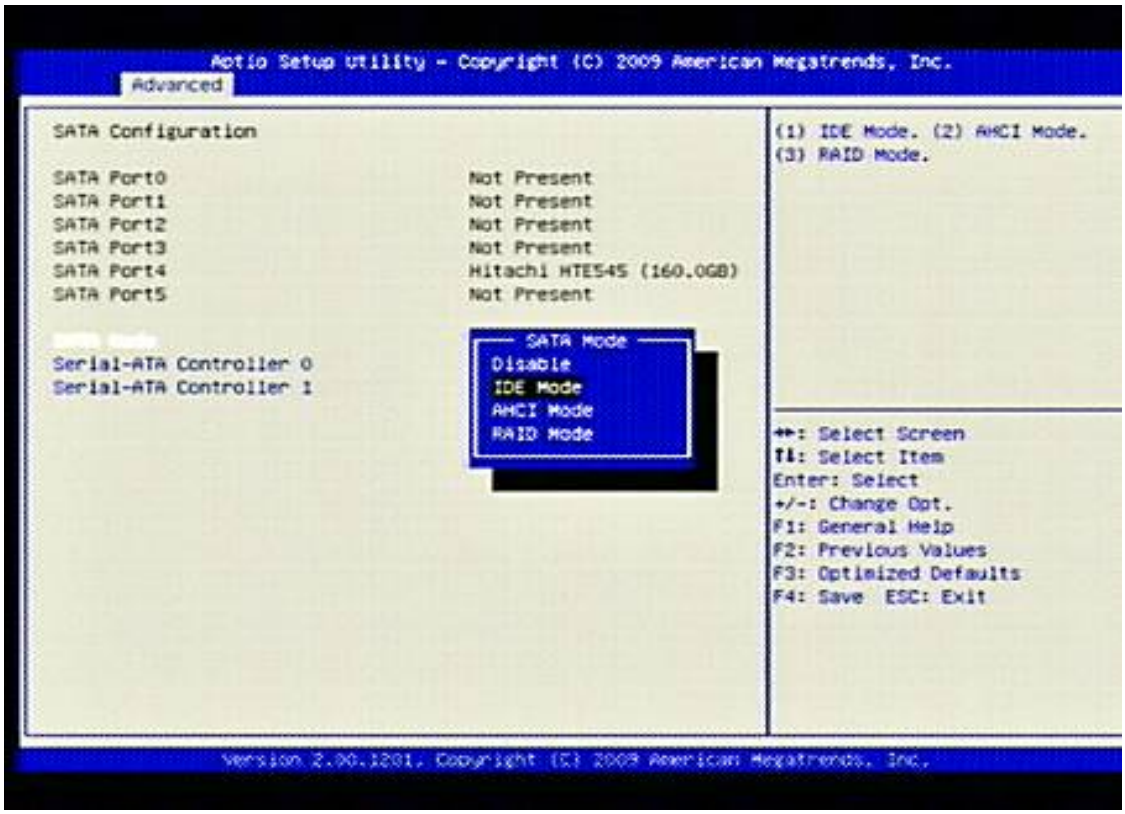
Choices: Disabled, Enabled.

Power Technology



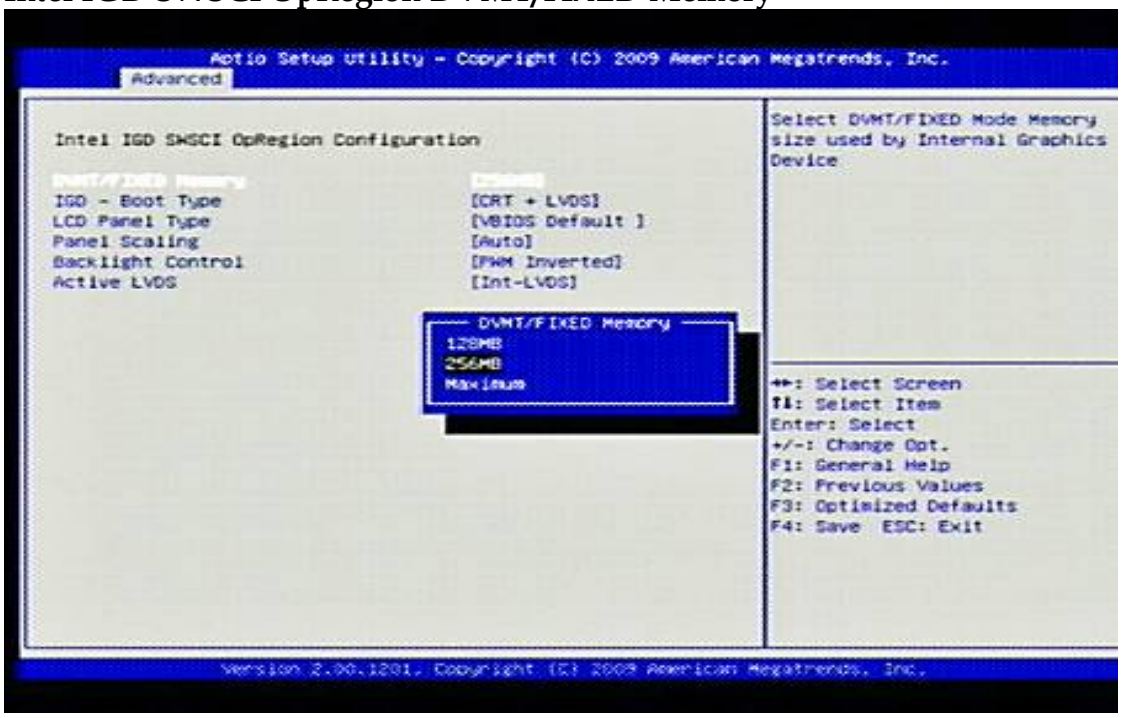
Choices: Disabled, Energy Efficient, Custom

SATA Mode



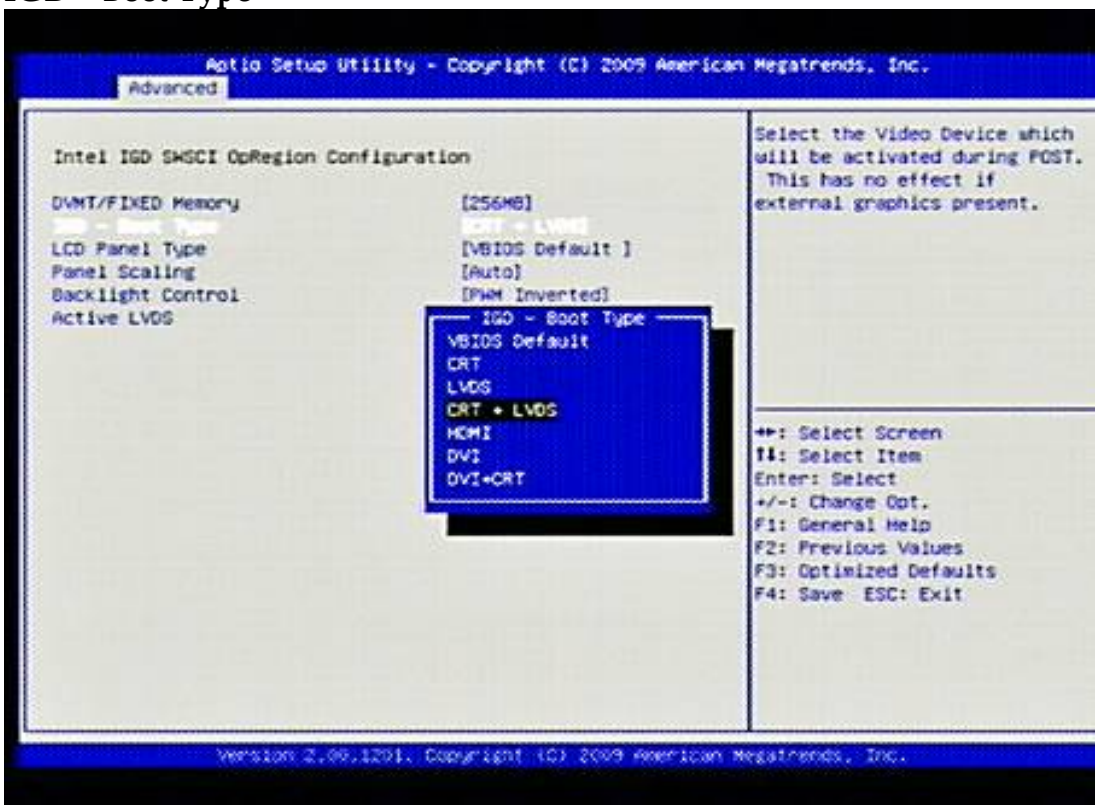
This setting specifies the function of the on-chip SATA controller.
Choices: Disabled, IDE Mode, RAID Mode, AHCI Mode.

Intel IGD SWSCI OpRegion DVMT/FIXED Memory



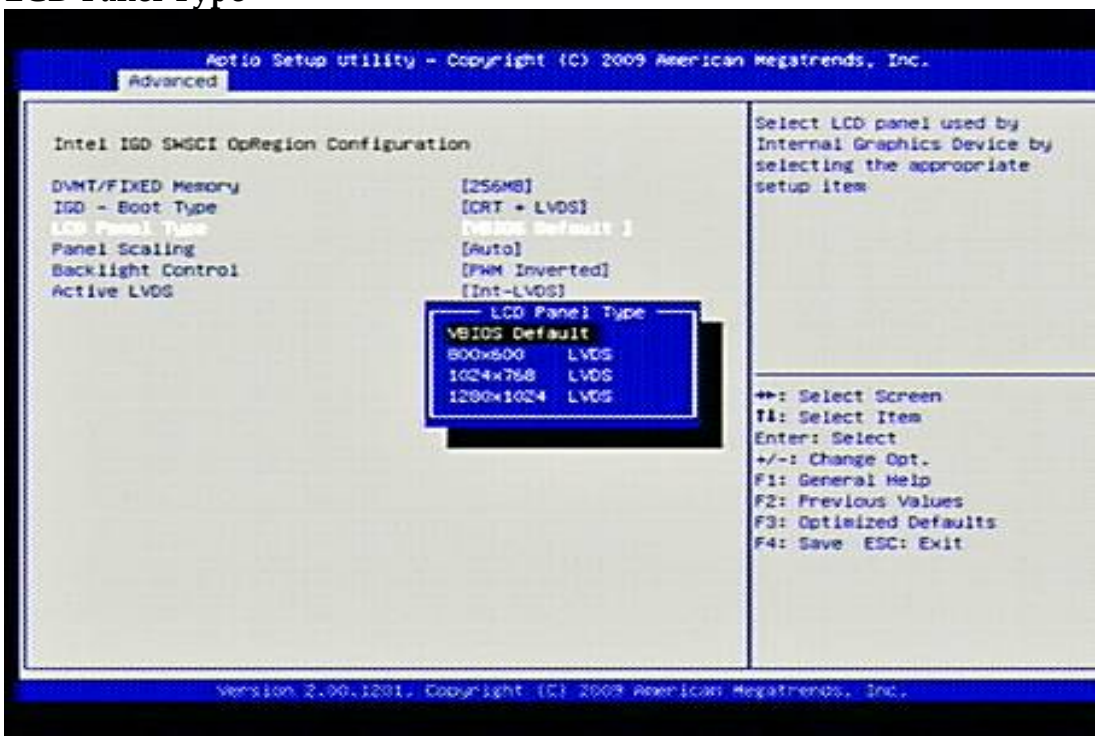
Choices: 128M, 256MB, Maximum

IGD – Boot Type



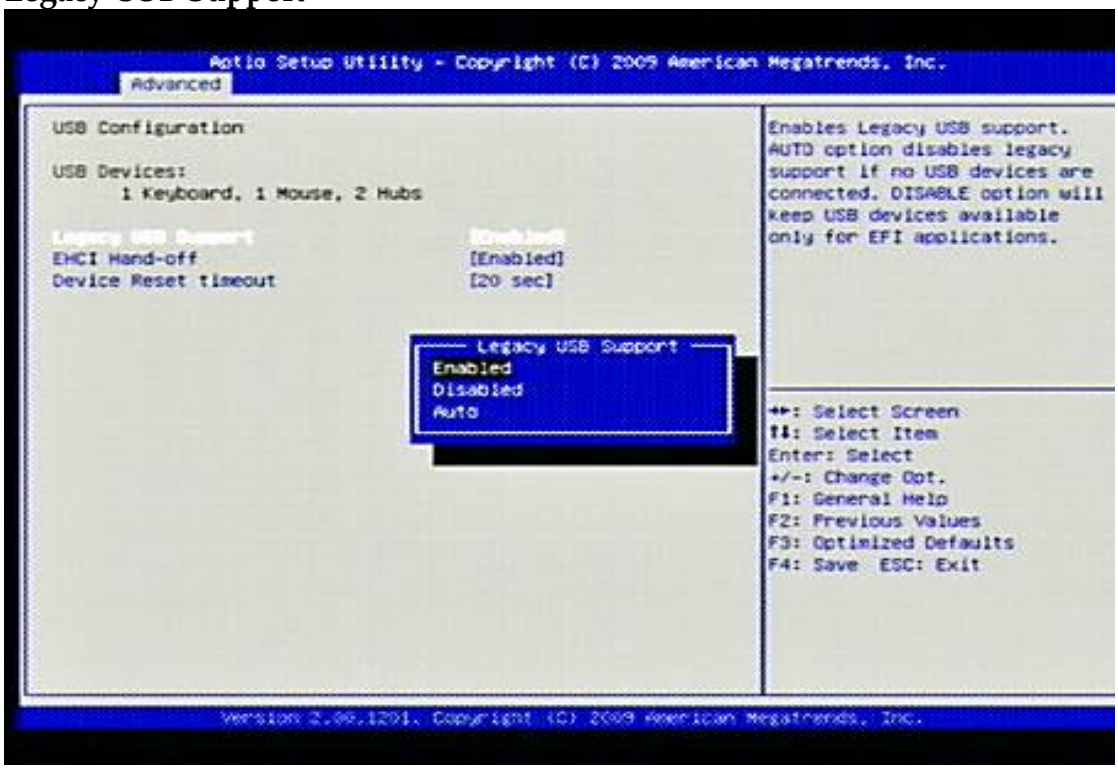
Select the Video Device which will be activated during POST.
Choices: VBIOS Default, CRT, LVDS, CRT+LVDS, HDMI, DVI, DVI+CRT.

LCD Panel Type


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Intel IGD SWSCI OpRegion Configuration
DVMT/FIXED Memory [256MB]
IGD - Boot Type [CRT + LVDS]
Panel Scaling [Auto]
Backlight Control [PWM Inverted]
Active LVDS [Int-LVDS]
LCD Panel Type
VBIOS Default
800x600 LVDS
1024x768 LVDS
1280x1024 LVDS
Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

Choices: VBIOS Default, 800x600 LVDS, 1024x768 LVDS, 1280x1024 LVDS.

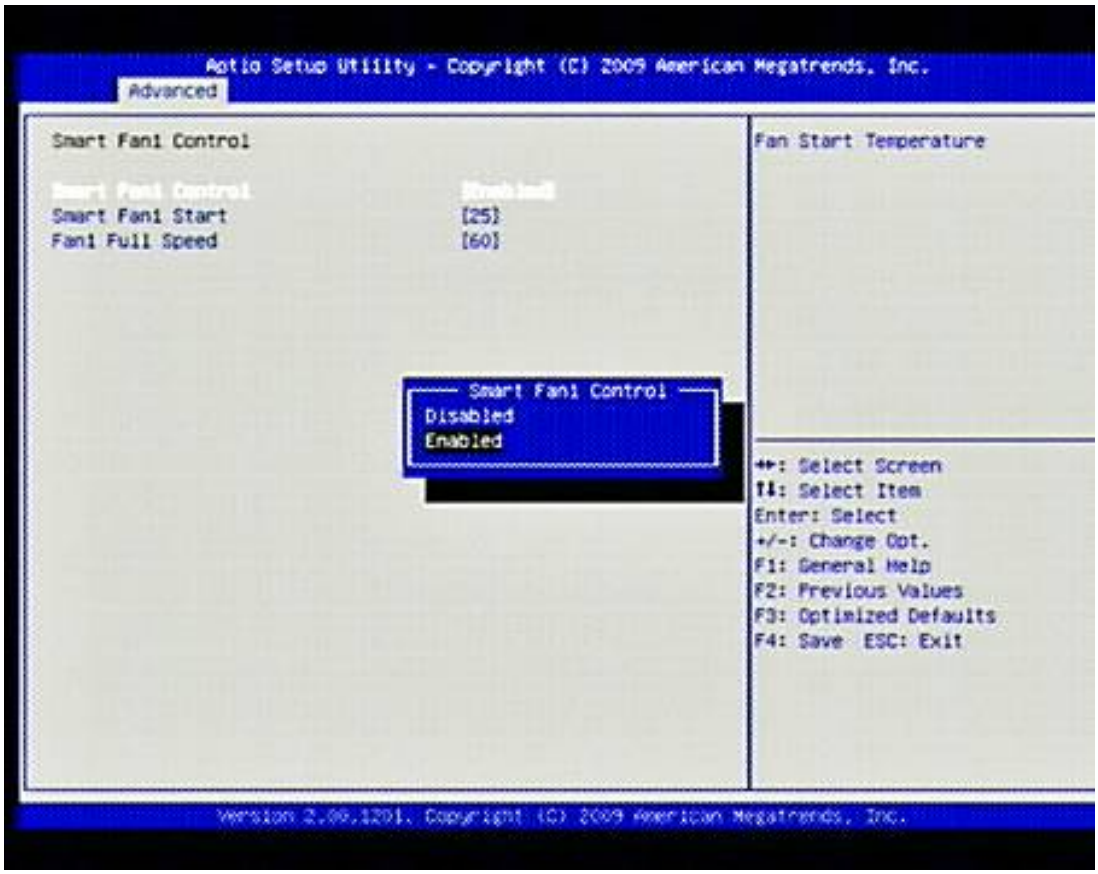
Legacy USB Support


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
USB Configuration
USB Devices:
1 Keyboard, 1 Mouse, 2 Hubs
EHCI Hand-off [Enabled]
Device Reset timeout [20 sec]
Legacy USB Support
Enabled
Disabled
Auto
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

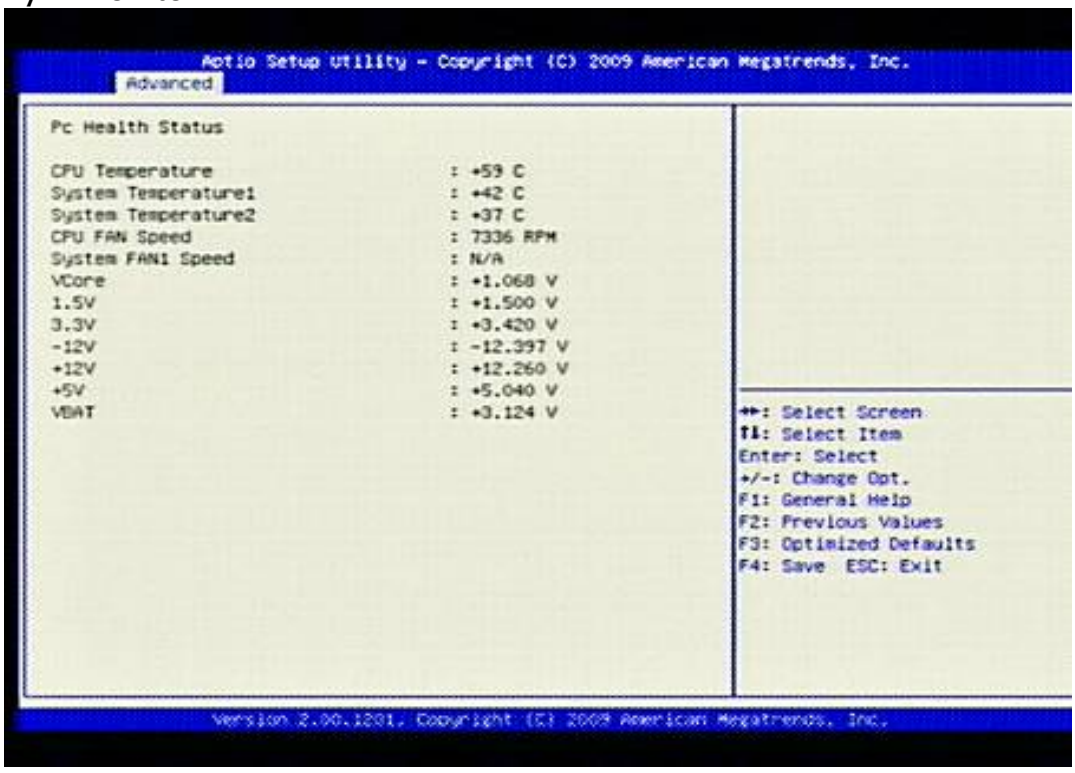
Choices: Disabled, Enabled, Auto.

Smart Fan1 control

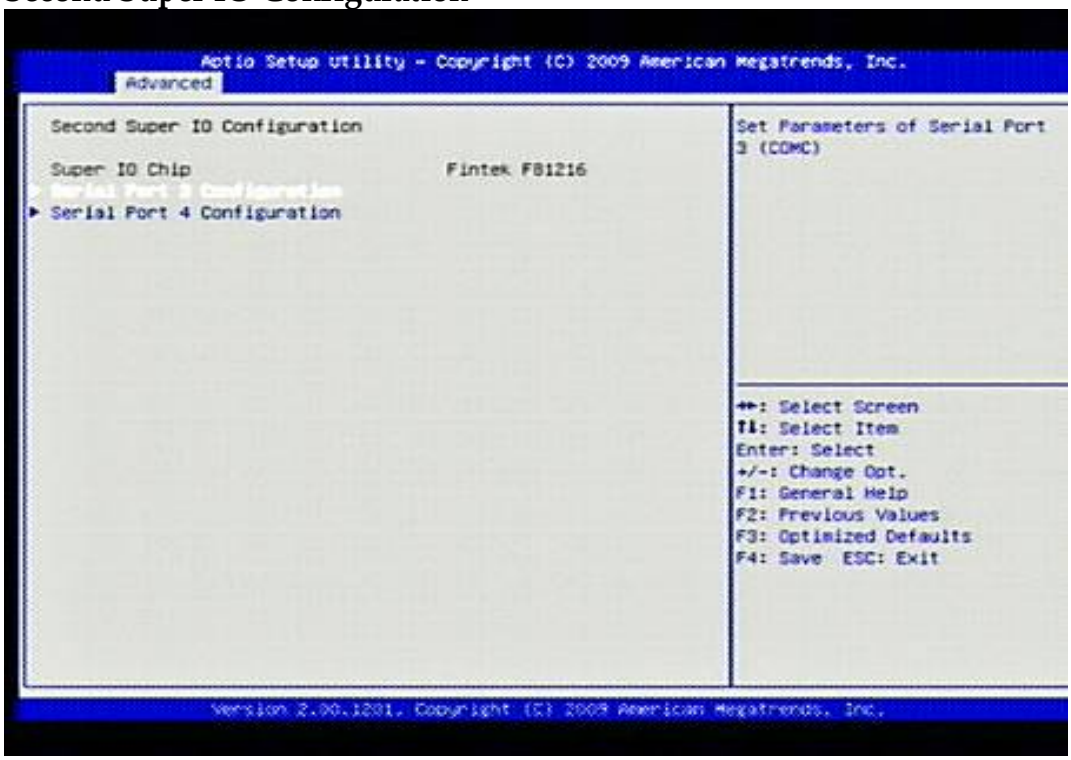


Choices: Disabled, Enabled.

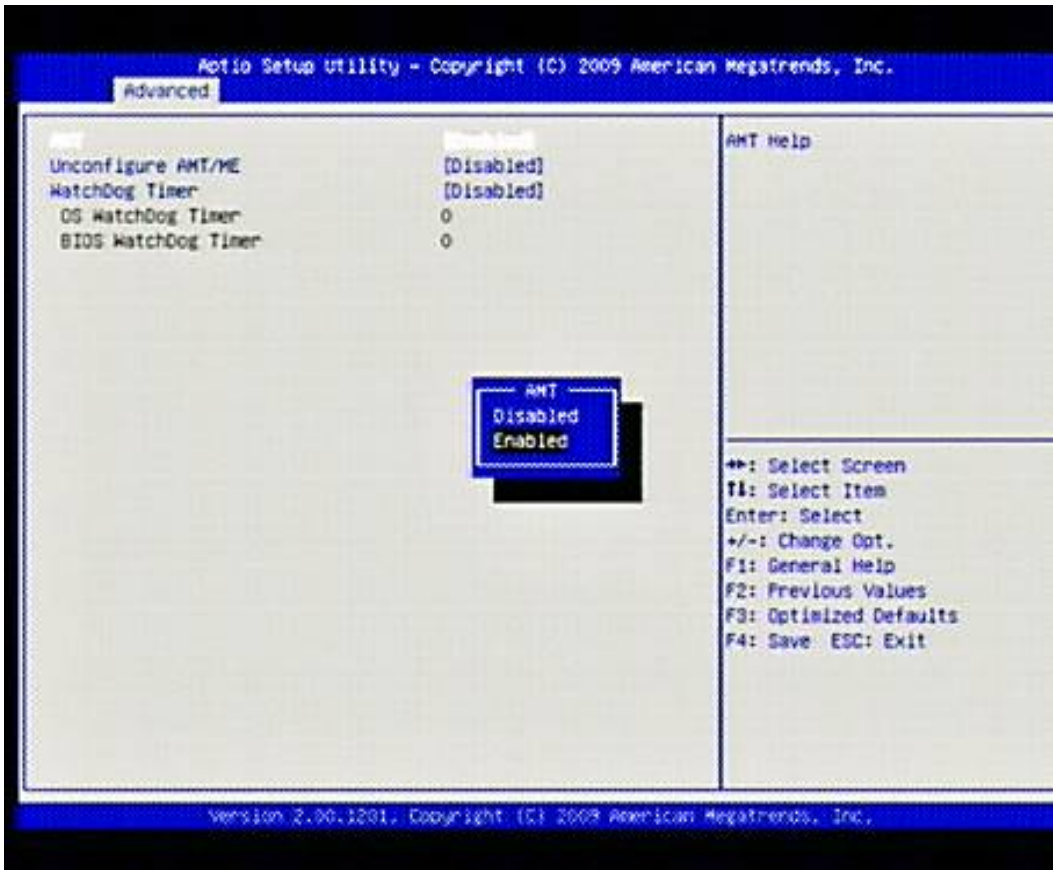
H/W monitor


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Pc Health Status
CPU Temperature : +59 C
System Temperature1 : +42 C
System Temperature2 : +37 C
CPU FAN Speed : 7336 RPM
System FAN1 Speed : N/A
VCore : +1.068 V
1.5V : +1.500 V
3.3V : +3.420 V
-12V : -12.397 V
+12V : +12.260 V
+5V : +5.040 V
VBAT : +3.124 V
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

Second Super IO Configuration



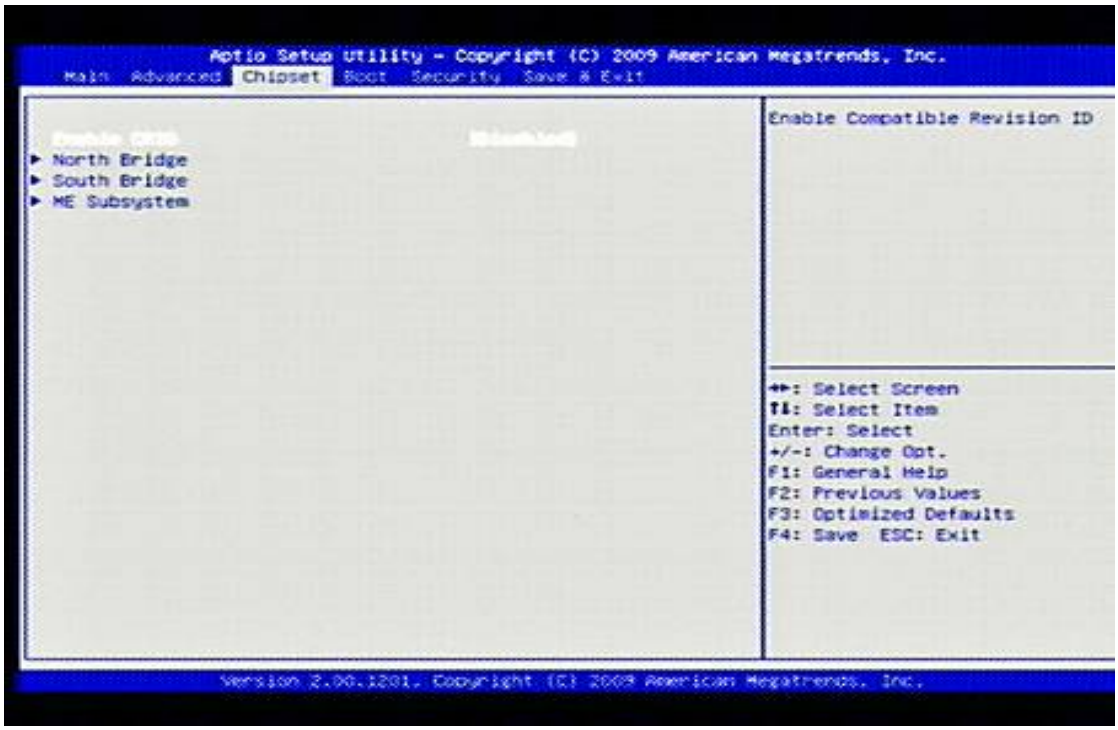
AMT



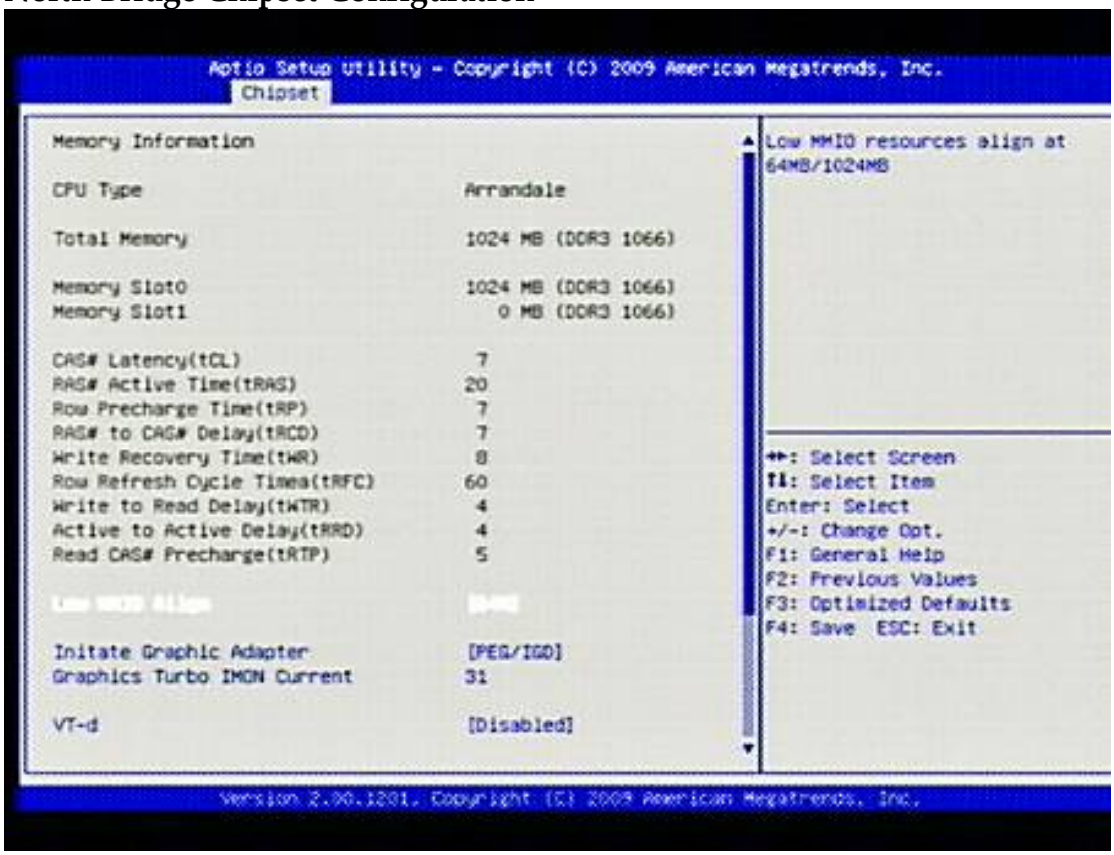
Choices: Disabled, Enabled.

4.4 Chipset

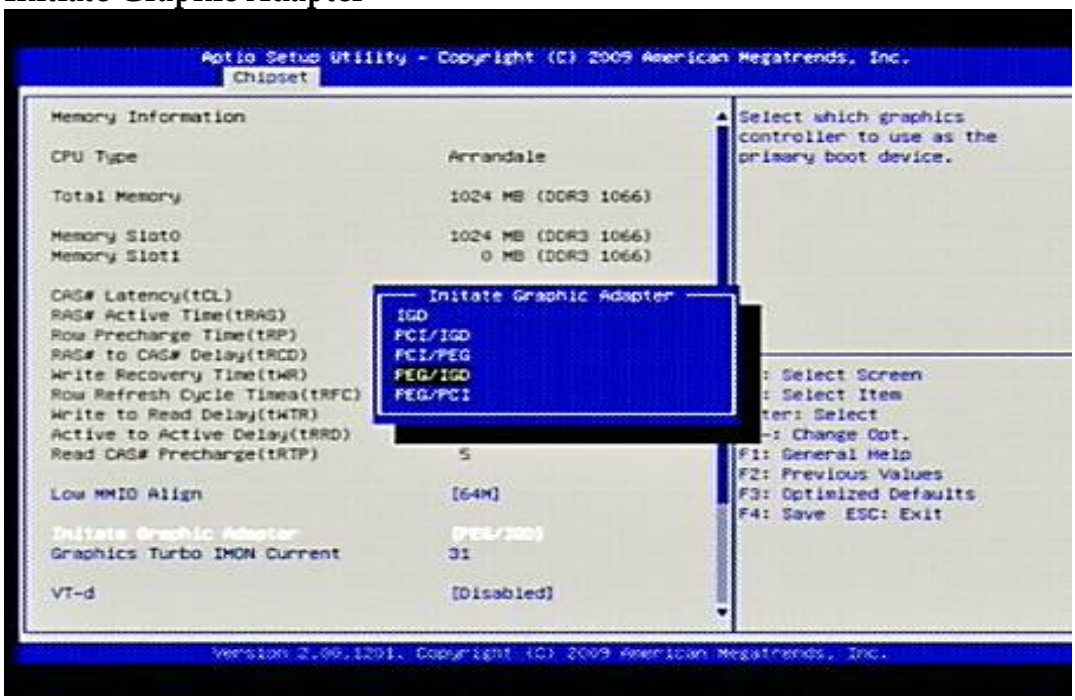
This menu controls the advanced features of the onboard Northbridge and Southbridge.


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
North Bridge
South Bridge
ME Subsystem
Enable Compatible Revision ID
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

North Bridge Chipset Configuration

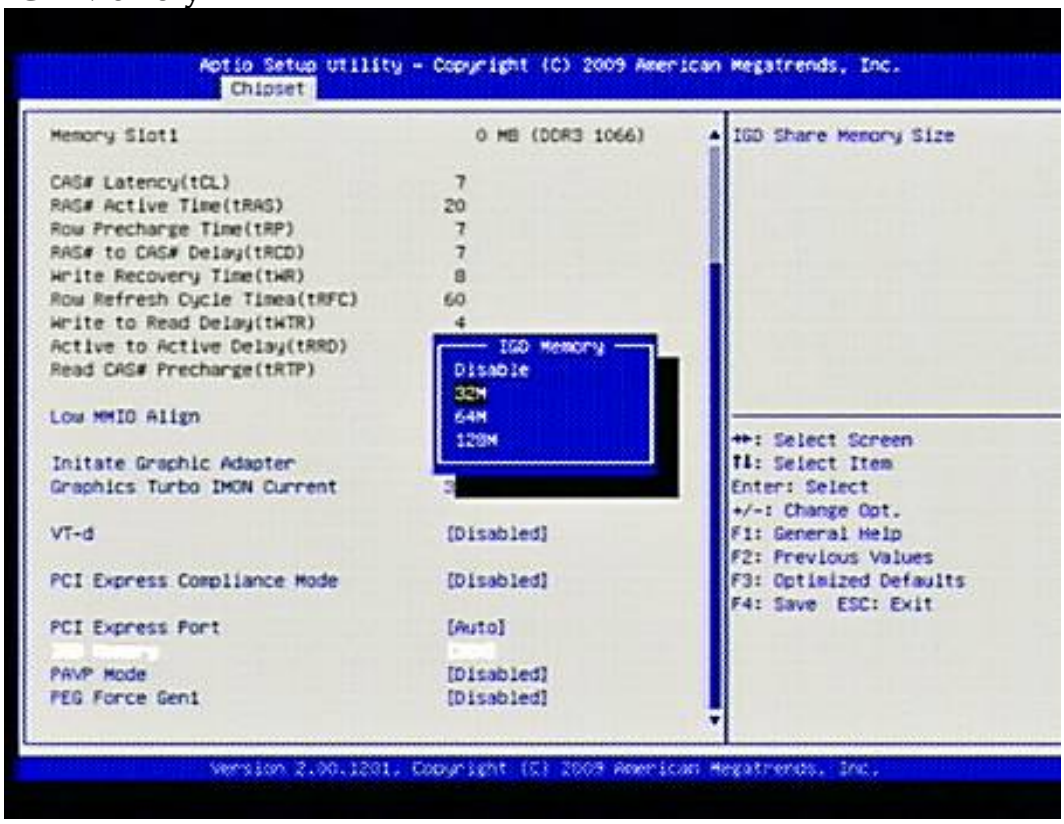

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Chipset
Memory Information
CPU Type Arrandale
Total Memory 1024 MB (DDR3 1066)
Memory Slot0 1024 MB (DDR3 1066)
Memory Slot1 0 MB (DDR3 1066)
CAS# Latency(tCL) 7
RAS# Active Time(tRAS) 20
Row Precharge Time(tRP) 7
RAS# to CAS# Delay(tRCD) 7
Write Recovery Time(tWR) 8
Row Refresh Cycle Time(tRFC) 60
Write to Read Delay(tWTR) 4
Active to Active Delay(tRRD) 4
Read CAS# Precharge(tRTP) 5
Initate Graphic Adapter [PEG/IGD]
Graphics Turbo IMON Current 31
VT-d [Disabled]
Low MMIO resources align at 64MB/1024MB
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

Initiate Graphic Adapter



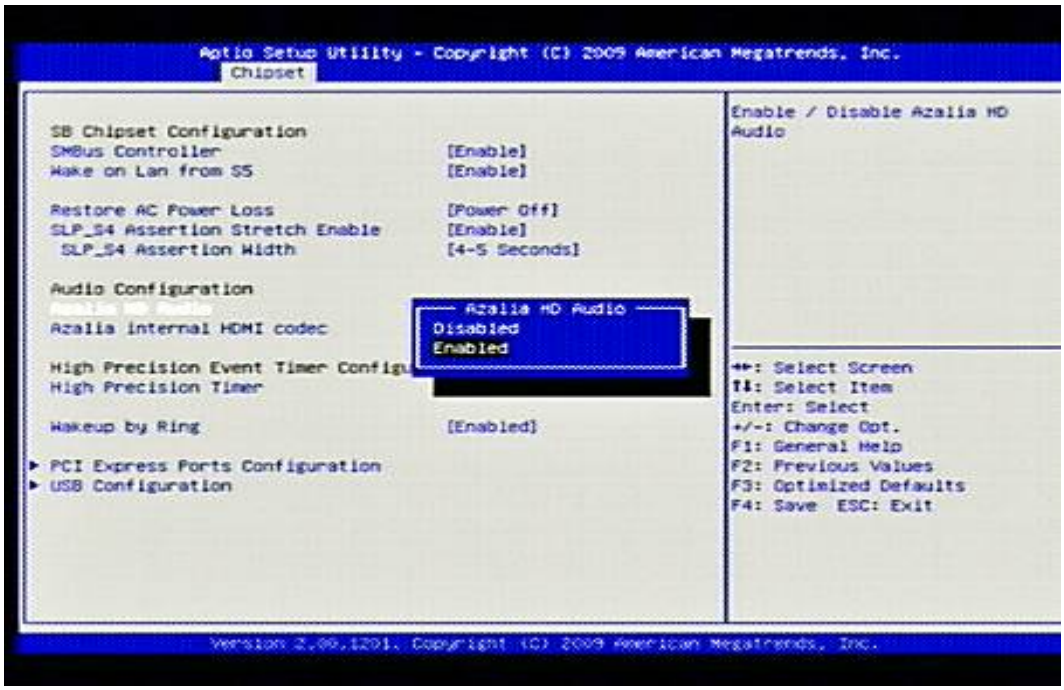
Select which graphics controller to use as the primary boot device.
Choices: IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI.

IGD Memory



Choices: Disabled, 32M, 64M, 128M

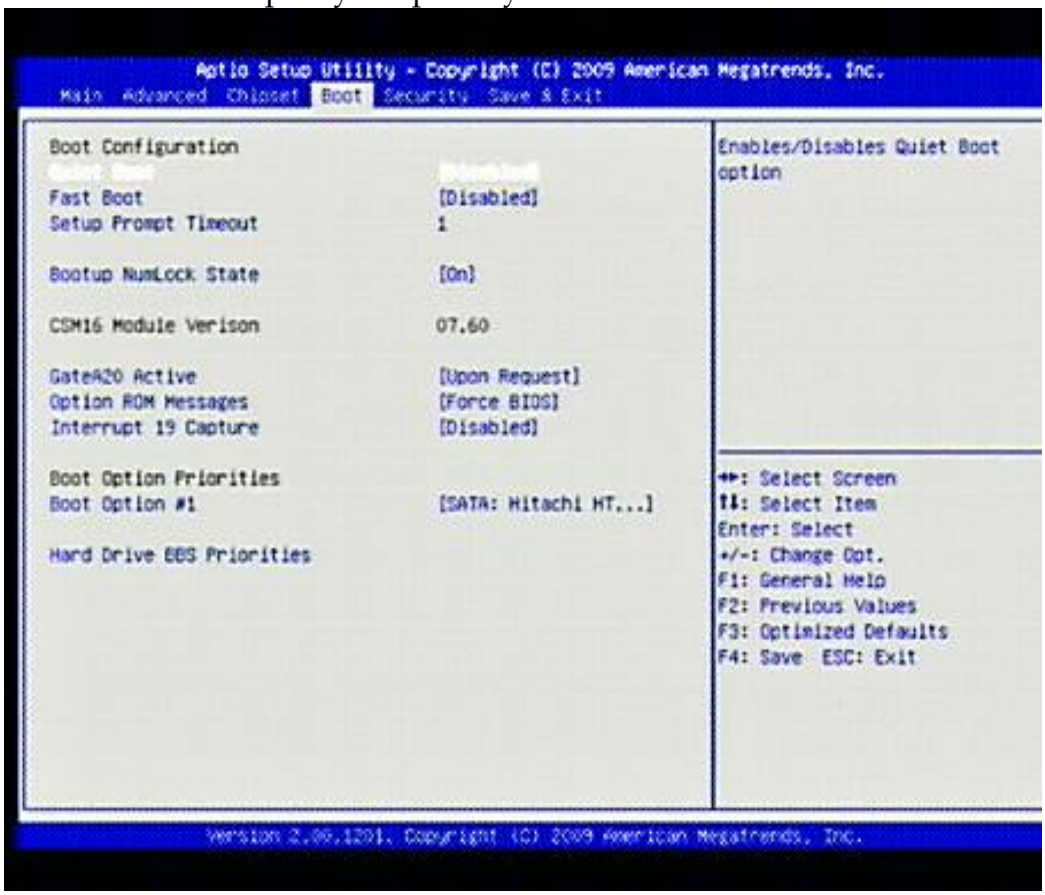
South Bridge Chipset Configuration
Azalia HD Audio



Choices: Disabled, Enabled.

4.5 Boot

Use this menu to specify the priority of boot devices.


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Boot Configuration
Fast Boot [Disabled]
Setup Prompt Timeout 1
Bootup NumLock State [On]
CSM16 Module Version 07.60
GateA20 Active [Upon Request]
Option ROM Messages [Force BIOS]
Interrupt 19 Capture [Disabled]
Boot Option Priorities
Boot Option #1 [SATA: Hitachi HT...]
Hard Drive BBS Priorities
Enables/Disables Quiet Boot option
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit

Quiet Boot

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo. When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

Choices: Disabled, Enabled.

Fast Boot

Enabling this setting will cause the BIOS POST routine to skip some of its tests during boot up for faster system boot.

Choices: Disabled, Enabled.

Boot Up Num-Lock State
This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

Choices: On, Off.

GateA20 Active
Choices: Upon Request, Always

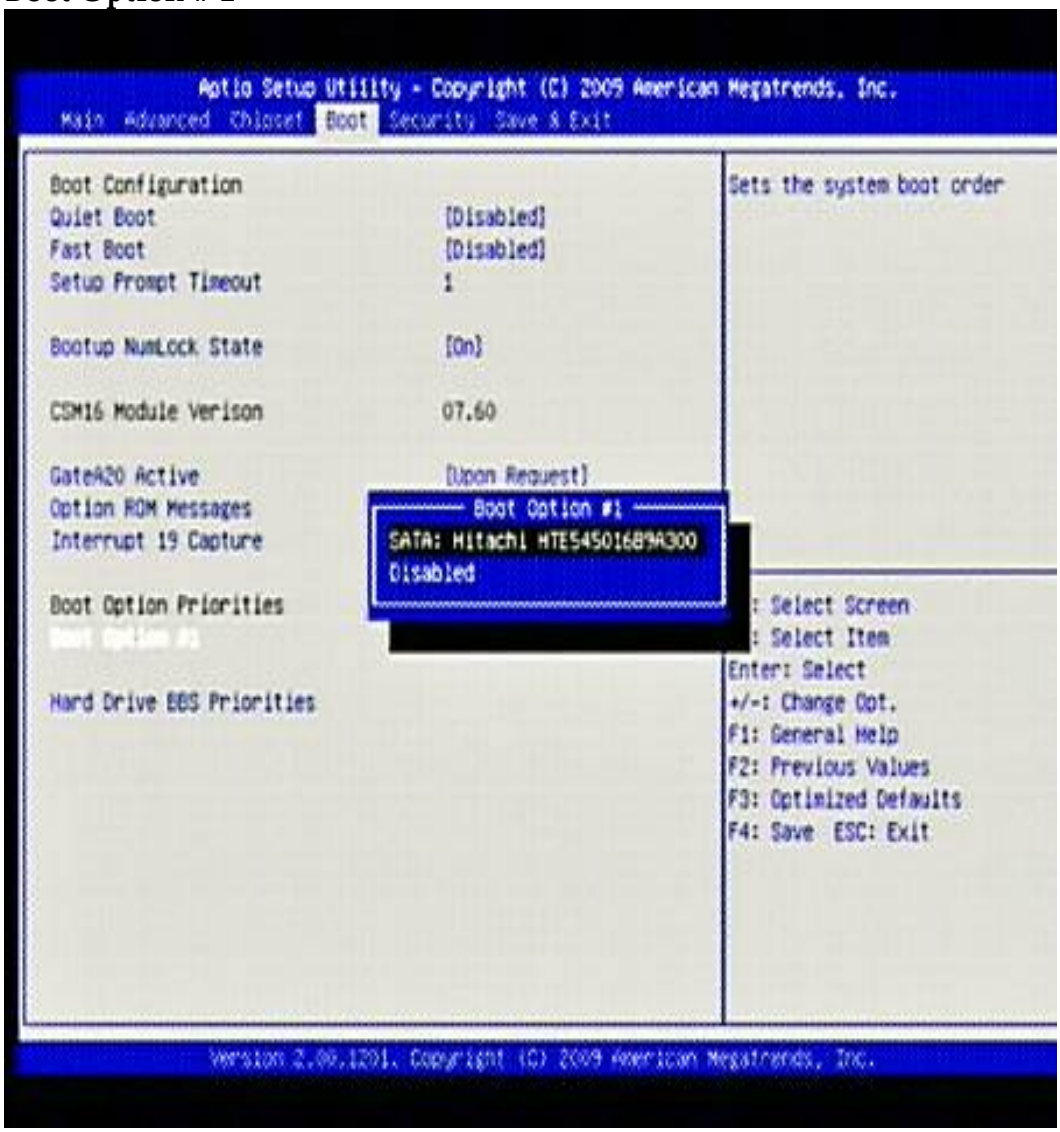
Option ROM Messages
This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

Choices: Force BIOS, Keep Current.
Interrupt 19 Capture
Interrupt 19 is the software interrupt that handles the boot disk function. When enabled, this BIOS feature allows the ROM BIOS of these host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks. In addition, it allows you to gain access to the host adaptor's ROM setup utility, if one is available.

When it is disabled, the ROM BIOS of these host adaptors will not be able to "capture" the Interrupt 19. Therefore, you will not be able to boot operating systems from any bootable disks attached to these host adaptors. Nor will you be able to gain access to their ROM setup utilities.

Choices: Disabled, Enabled.

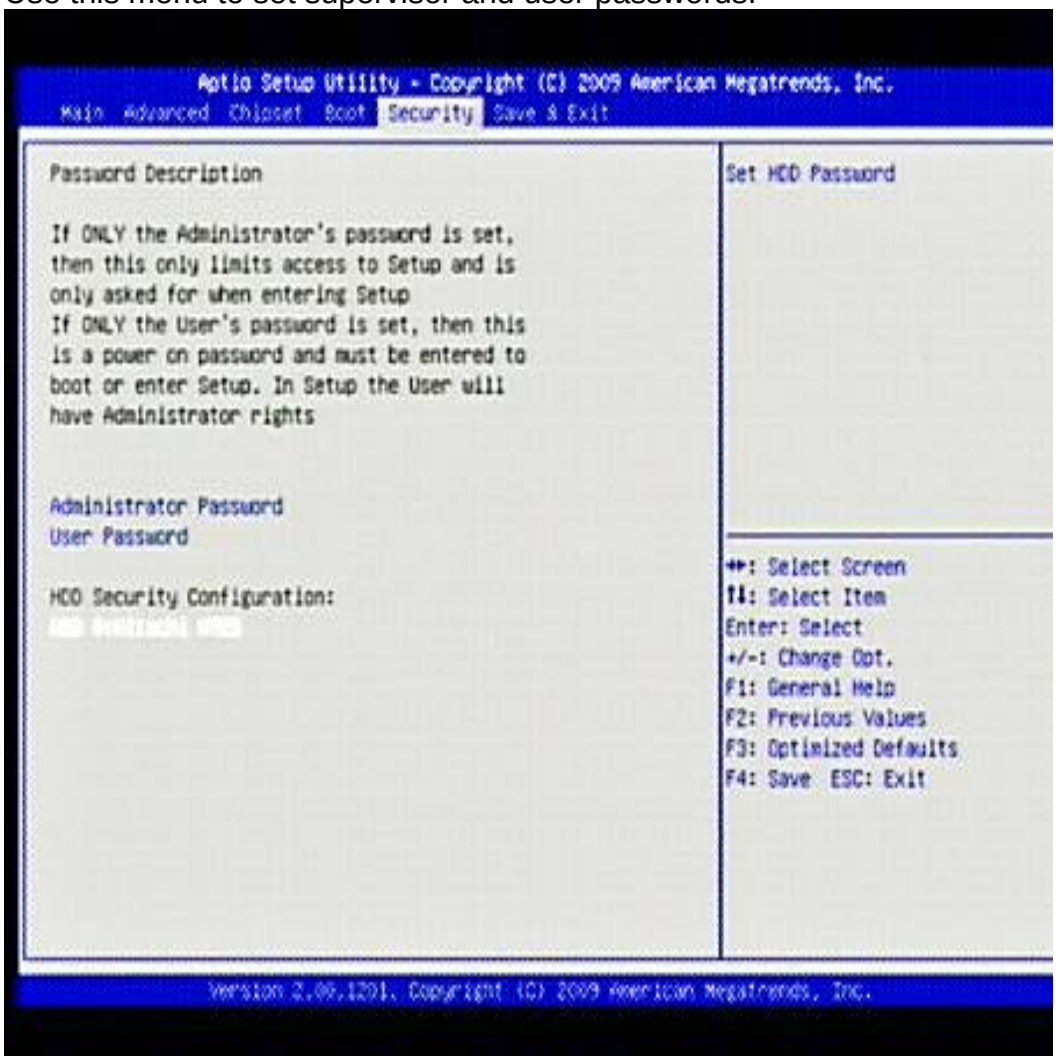
Boot Option # 1



Choices: Built-in EFI Shell, Optional Bootable Device

4.6 Security

Use this menu to set supervisor and user passwords.


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights
Administrator Password
User Password
HDD Security Configuration:
Set HDD Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

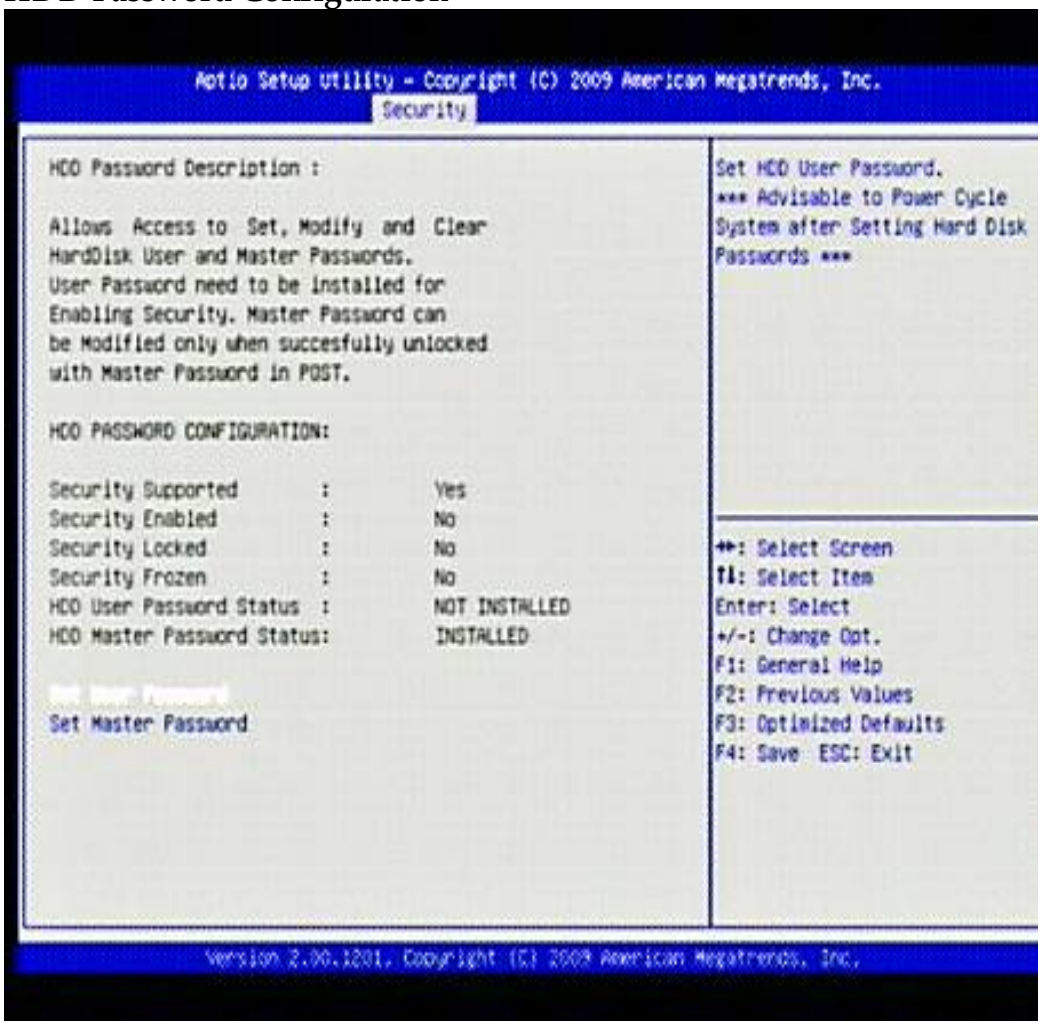
Administrator Password

Administrator Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

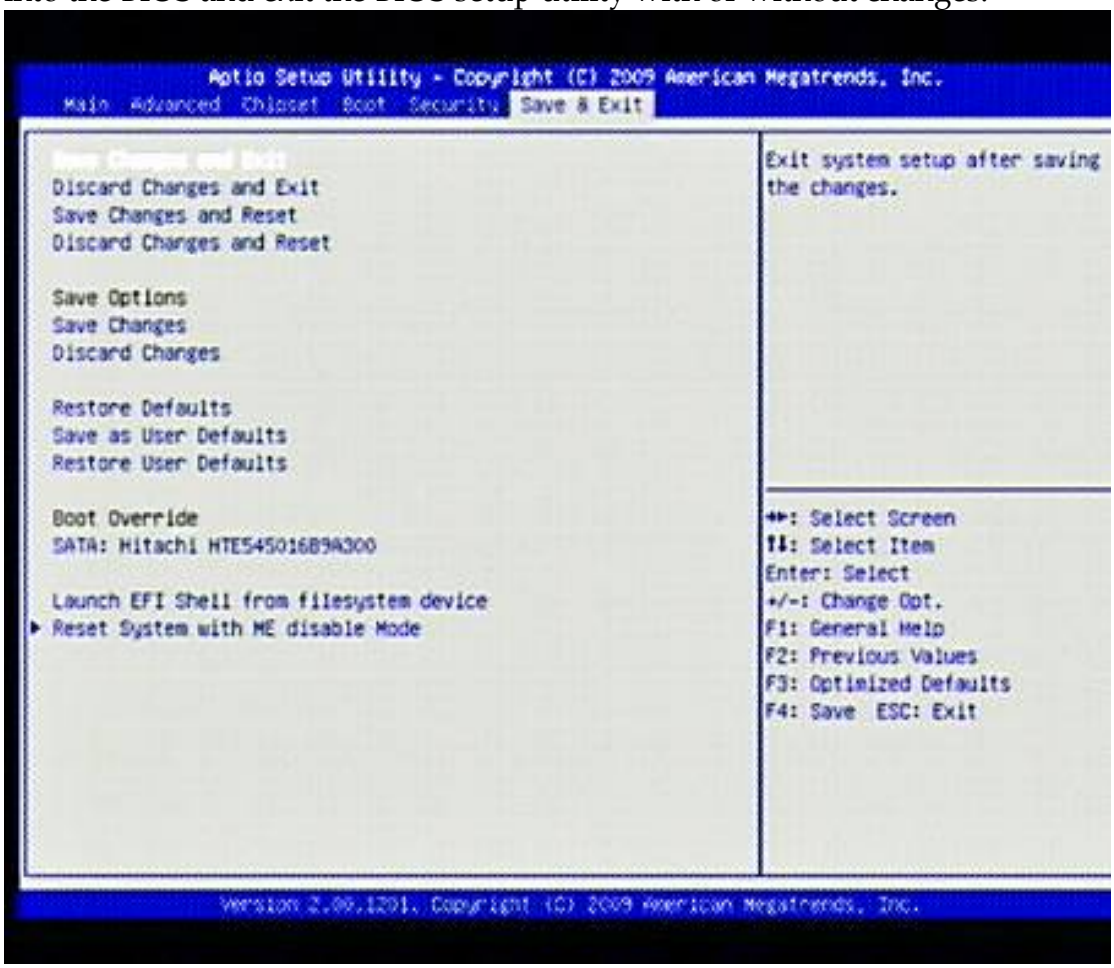
HDD Password Configuration


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Security
HDD Password Description :
Allows Access to Set, Modify and Clear HardDisk User and Master Passwords. User Password need to be installed for Enabling Security. Master Password can be Modified only when succesfully unlocked with Master Password in POST.
HDD PASSWORD CONFIGURATION:
Security Supported : Yes
Security Enabled : No
Security Locked : No
Security Frozen : No
HDD User Password Status : NOT INSTALLED
HDD Master Password Status: INSTALLED
Set Master Password
Set HDD User Password.
*** Advisable to Power Cycle System after Setting Hard Disk Passwords ***
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

Allows access to set, modify, and clear Hard disk user and master password. Must be supported by HDD specification to enable this function.

4.7 Save & Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Discard Changes and Exit
Save Changes and Reset
Discard Changes and Reset
Save Options
Save Changes
Discard Changes
Restore Defaults
Save as User Defaults
Restore User Defaults
Boot Override
SATA: Hitachi HTE545016B9A300
Launch EFI Shell from filesystem device
Reset System with ME disable Mode
Exit system setup after saving the changes.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.09.1201. Copyright (C) 2009 American Megatrends, Inc.

Save Changes and Exit

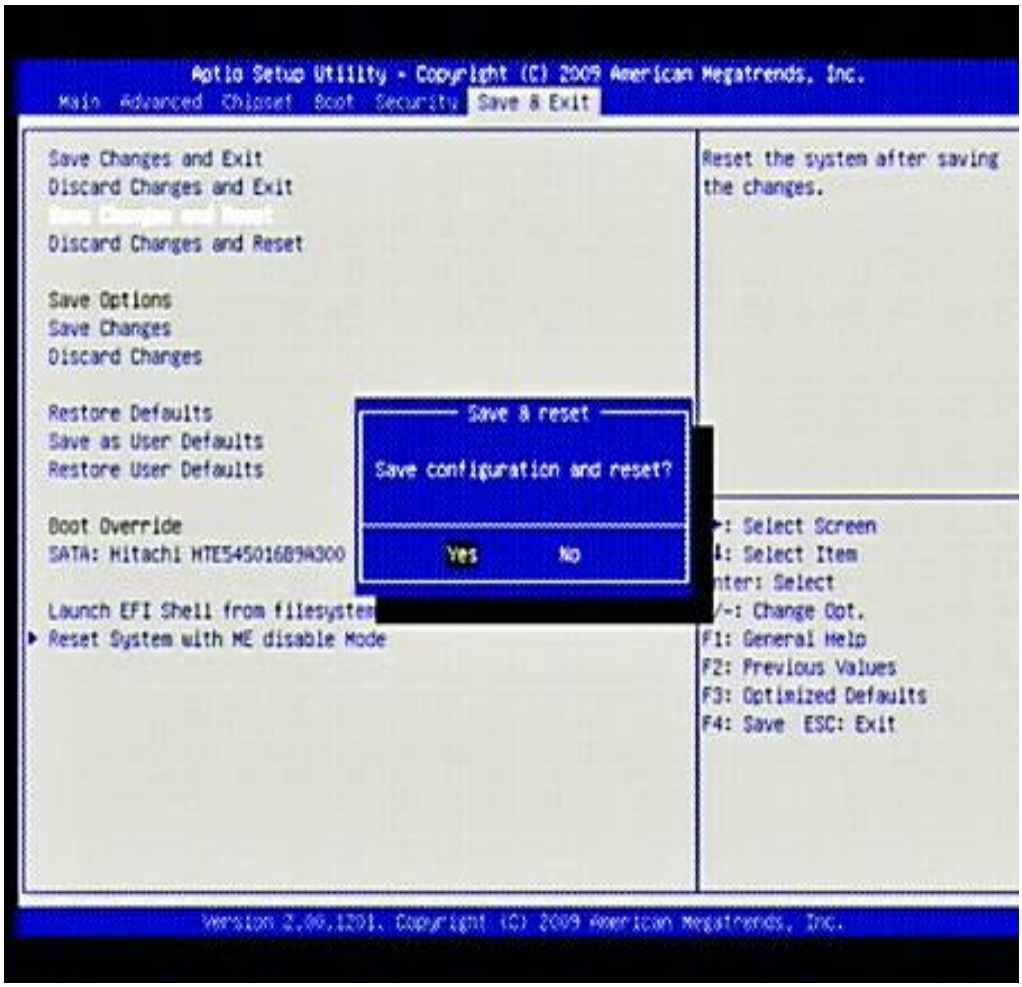
Exit System Setup and save your changes to CMOS. Pressing <Enter> on this item asks for confirmation: Save changes to CMOS and exit the Setup Utility.

Discard Changes and Exit

Abandon all changes and exit the Setup Utility.

Save Changes and Reset

Exit System Setup and save your changes to CMOS then reboot.

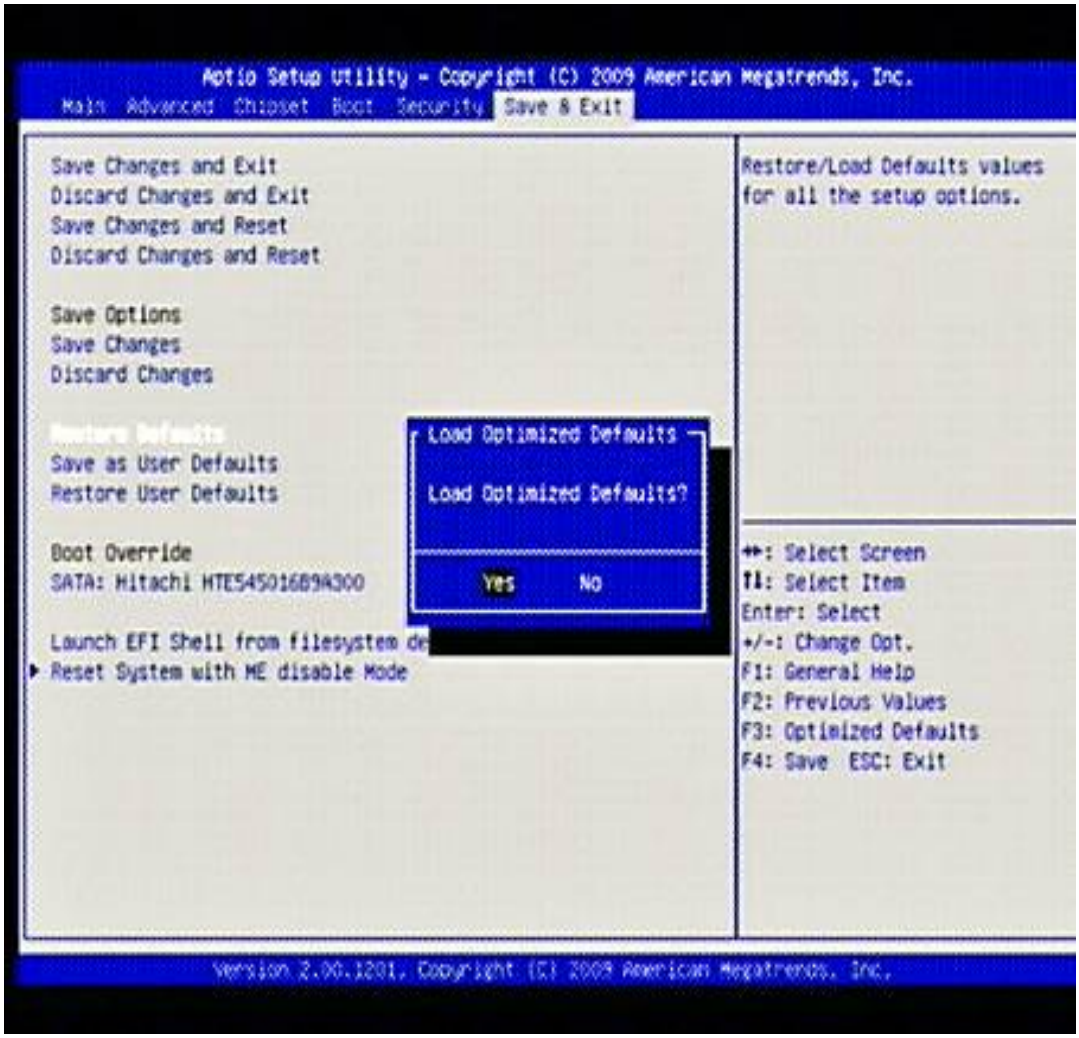


Discard Changes and Reset
Abandon all changes and exit the Setup Utility then reboot

Save Changes
Save all changes and continue with the Setup Utility.

Discard Changes
Abandon all changes and continue with the Setup Utility.

Restore Defaults
Use this menu to load the default values set by the SBC manufacturer specifically for optimal performance of the SBC.



Save as User Defaults
Save all changes and considers as User's default.

Restore User Default
Restore the setting according to User's default

Launch EFI Shell from filesystem device
To enter the Built-in EFI shell for further modification such as upgrade BIOS.

Reset System with ME disable Mode
Reset the system with ME disabled.

Chapter 5
Troubleshooting

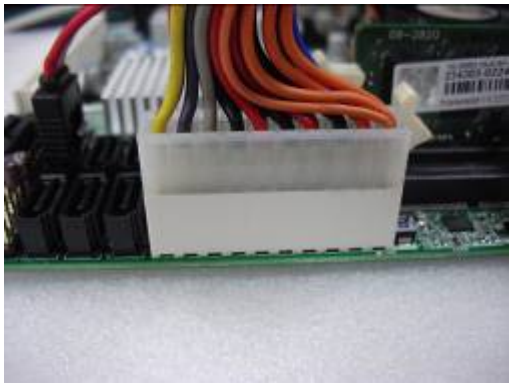
This chapter provides a few useful tips to quickly get WADE-8020 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

ATX Power Setting

WADE-8020 supports ATX. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—J11 (4 pins CPU +12V main power connector) & J30 (20 pins ATX Power Connector)

ATX Power Connector



4-Pins CPU Main Power Connector

Serial ATA Hard Disk Setting for IDE/RAID/AHCI

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; there are total six connectors, SATA1~6 port. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to

operate IDE, RAID (0/1/5/10) and AHCI application for system, please follow up setting guide in BIOS setup utility (Table 5-1).

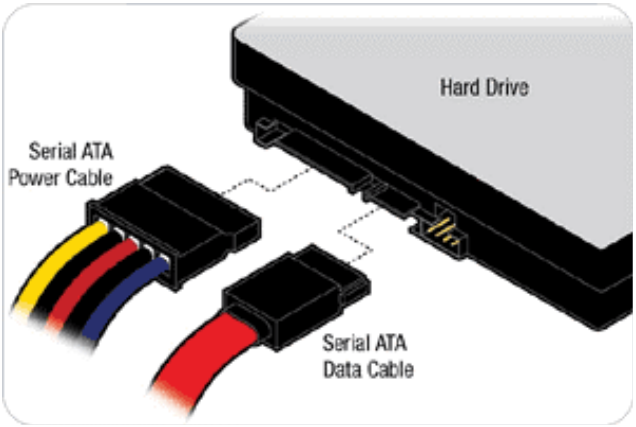


Table. 5-1 SATA Mode setting guide

System BIOS
- Advanced Settings
  - IDE Configuration ..... [Press enter]
    - Configure SATA#1 as..... [IDE/RAID/AHCI]

5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. CPU, CPU Fan, 204-pin DDR3 memory, keyboard, mouse, floppy drive, SATA hard disk, DVI-I connector, but it only can use on DVI-D function, doesn't support DVI-I function, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8020, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "Load Optimal Defaults", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the COM1/ COM2 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are
Disable COM1 serial port to release IRQ #4
Disable COM2 serial port to release IRQ #3

Etc…

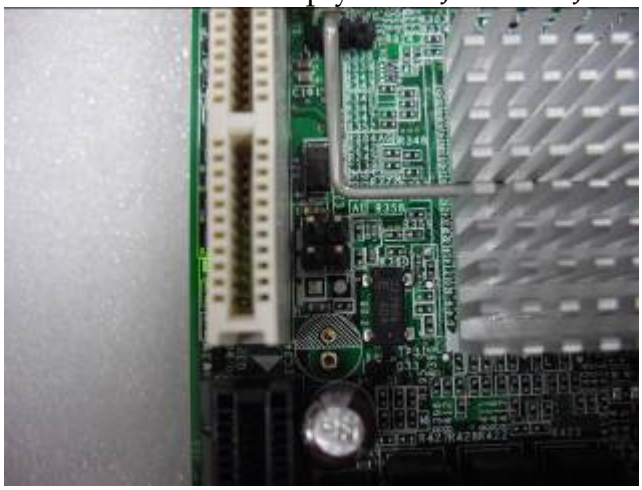
A quick review of the basic IRQ mapping is given below for your reference.

IRQ #0 System Timer
IRQ #1 Keyboard Event
IRQ #2 Usable IRQ
IRQ #3 COM2
IRQ #4 COM1
IRQ #5 Usable IRQ
IRQ #6 Diskette Event
IRQ #7 Usable IRQ
IRQ #8 Real-Time Clock
IRQ #9 Usable IRQ
IRQ #10 Usable IRQ
IRQ #11 Usable IRQ
IRQ #12 IBM Mouse Event
IRQ #13 Coprocessor Error
IRQ #14 Hard Disk Event
IRQ #15 Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 FAQ

Installation Problem
Question: I forget my password of system BIOS, what am I supposed to do?
Answer: You can simply short JP14 and JP15 (clear CMOS) to reset your password.



Question: How to update the BIOS file of the WADE-8020?

Answer:

Please visit web site of the Portwell download center as below hyperlink and register an account. http://www.portwell.com.tw/support/

Input your User name and password to log in the download center.

Select the "Search download" to input the keyword "WADE-8020".

Find the "BIOS" page to download the ROM file and flash utility.

Execute the zip file to root of the bootable USB Pen drive.

Insert your bootable USB Pen drive in WADE-8020 board and power-on.

Input the "FPT /f XXXXX.ROM /BIOS" to start to update BIOS. ("XXXXX" is the file name of the ROM file.)

Switch "Off" the Power Supply when you finished the update process.

To short the JP14 and JP15 jumper for 5 seconds then set back to normal. (Clear CMOS)

Switch "ON" the Power Supply then press the "del" key to BIOS to load "Restore Defaults" then save them to exit.

Note:

Please visit our technical web site at http://www.portwell.com.tw

For additional technical information, which is not covered in this manual, you can mail to tsd@mail.portwell.com.tw or to our sales for further assistance. Thank you.